DECEMBER 26, 1936

Railway Age

Founded in 1856

McCARTNEY LIBRARY
GENEVA COLLEGE

THESE TWO NEW TRAINS BRING THE EMC DIESEL-POWERED ZEPHYR MILEAGE UP TO 5903 MILES PER DAY

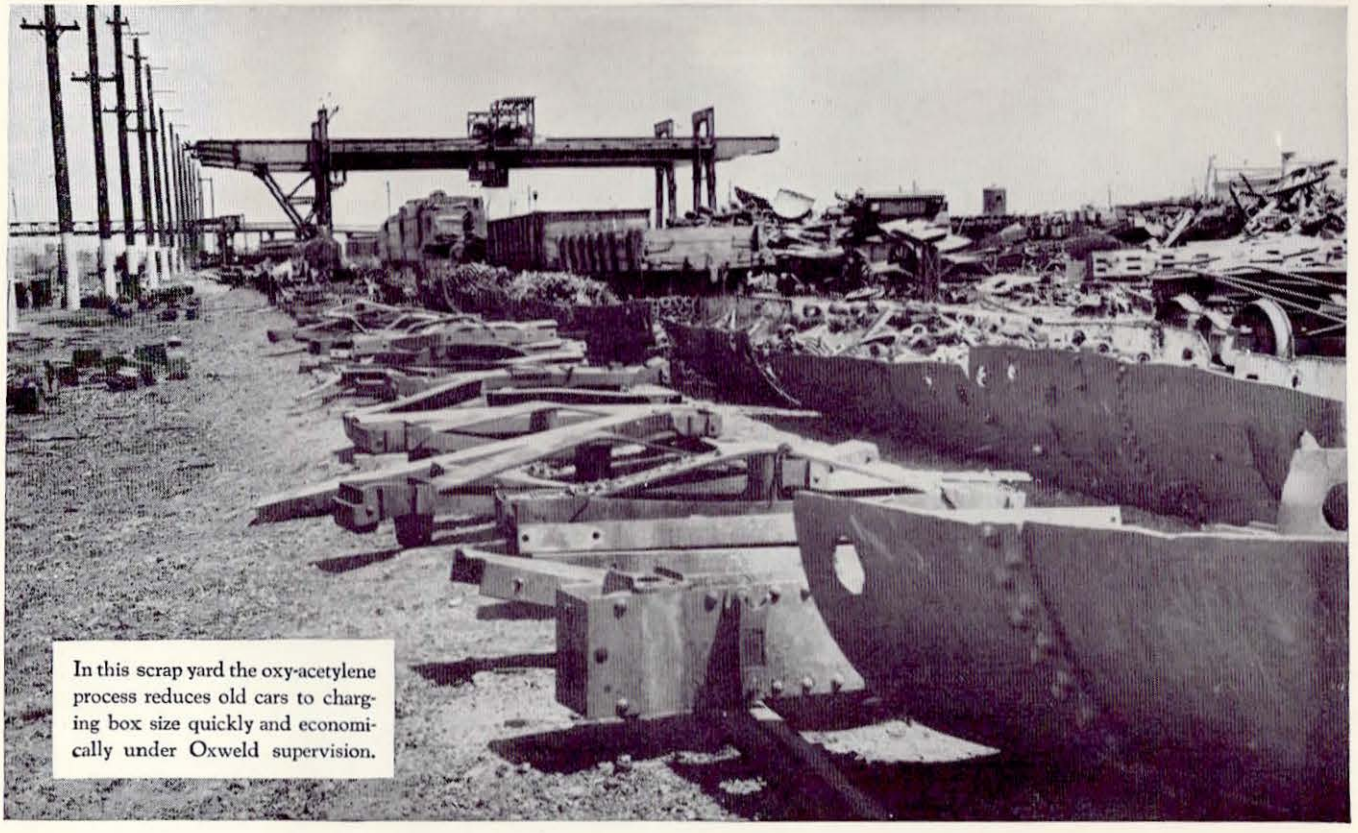
● These two new 1800 H. P. locomotives, each powered by two 900 H. P. EMC Diesel Engines, are the latest additions to the Burlington fleet. . . . They are now in twice-daily service between Chicago and the Twin Cities, hauling new 7-car trains which provide a 250% increase in seating capacity over the previous Twin Zephyrs which were found to be inadequate to meet an overwhelming public demand.

ELECTRO-MOTIVE CORPORATION
SUBSIDIARY OF GENERAL MOTORS
LA GRANGE, ILLINOIS, U.S.A.

E-M

E M C DIESEL POWER

Make old cars *an asset*



In this scrap yard the oxy-acetylene process reduces old cars to charging box size quickly and economically under Oxweld supervision.

by Oxy-Acetylene Cutting

OLD cars and locomotives can be converted into a valuable cash asset by oxy-acetylene cutting under Oxweld procedures. A scrapping program organized by Oxweld will bring you the greatest cash return on your obsolete equipment. Only by reducing your scrap to charging box size will you get the highest prices. The cost of oxy-acetylene cutting is but a fraction of the increase in price you will receive for your scrap.

The Oxweld Railroad Service Company is well qualified by years of experience to help you with your demolition and reclamation work. The planning and execution of efficient scrapping programs is one of the many ways in which Oxweld has served the oxy-acetylene requirements of a majority of the Class I Railroads of the country for nearly a quarter of a century.

THE OXWELD RAILROAD SERVICE COMPANY
Unit of Union Carbide and Carbon Corporation

UCC

New York: Carbide and Carbon Bldg. Chicago: Carbide and Carbon Bldg.

OXWELD RAILROAD SERVICE

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.

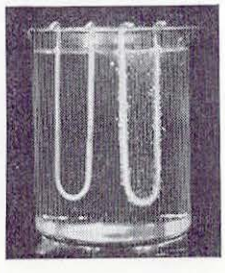
Right-of-way Fence

that defies corrosive atmosphere

BETHANIZED fence is right-of-way fence of a proved, superior kind. It is protected by a zinc coating which is applied by a newly perfected electrolytic process, and is so highly pure, so different in its physicial properties from galvanizing applied by older processes that it is like a new metal.

An outstanding advantage of bethanized fence for right-of-way service is its high resistance to the attack of corrosive acids formed from the sulphur gases contained in the smoke of coal-burning locomotives. This is due to the extreme purity of its heavy coating.

The test illustrated here will demonstrate this. The beaker contains two specimens of wire, one bethanized, the other galvanized, immersed in a sulphuric acid solution. Note that no bubbles are forming on the bethanized specimen (left), indicating its high resistance to attack by the acid, whereas clouds of bubbles rise from the galvanized specimen (right), showing that the acid is attacking it vigorously.



Bethanized coatings two or three times heavier than standard-weight galvanizing can be applied, yet they are so pliable and firmly bonded to the wire that they take the severest bending without flaking or scaling. This means that there is no impairment of the protection on bethanized fence by the wrapping at the joints in manufacture.

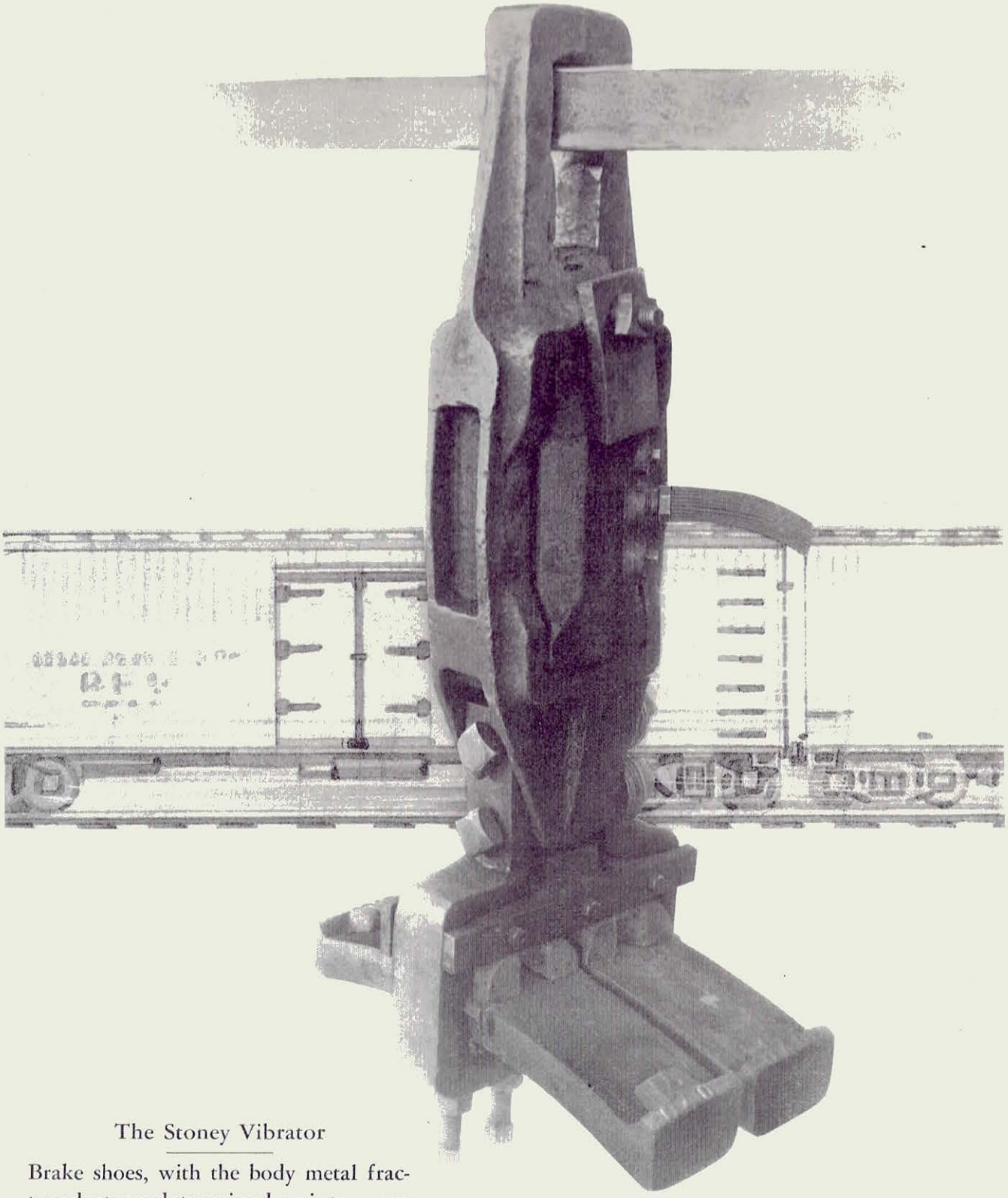
Bethanized wire is bringing economies in many other railway uses, such as telephone wire, strand and bond wire.

BETHLEHEM STEEL COMPANY, *General Offices:* Bethlehem, Pa. *District Offices:* Albany, Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Hartford, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Washington, Wilkes-Barre, York. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

VIBRATION and



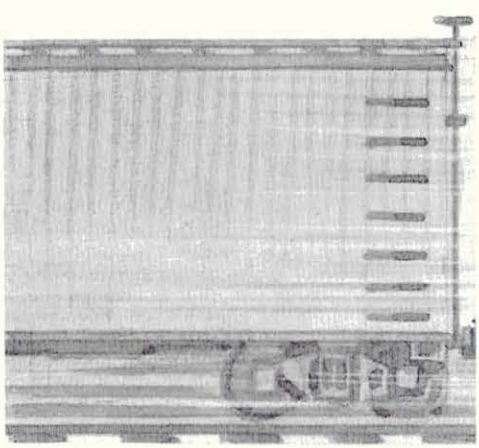
The Stoney Vibrator

Brake shoes, with the body metal fractured at predetermined points, were locked in this machine and vibrated. Months of operating conditions were reproduced in minutes.

BRAKE SHOES

THE A.A.R. has said that improvements in brake shoe design are necessary. Too many shoes break and fall apart before the shoe renders much useful service.

We realized the best comparative test of various designs of reinforcements for freight car shoes would be actual railroad operation, but this was not practical and would take too long. Yet, tests had to be made to find the best, and also to find the reason for the failure.



Therefore, we used the Vibrator for our test, as it reproduces quickly years of operating performance. It proved two things:

1. That the conventional steel back reinforcement, early in its life, becomes fatigued through vibration on the equipment, breaks and allows the shoe to fall apart.

2. That the new Duplane steel back reinforcement will withstand destructive vibration so much longer than any other known design of reinforcement, that through its use broken brake shoes should be practically eliminated.

If you do not know about Duplane steel reinforcements for freight car brake shoes, ask our representative.

●

THE AMERICAN BRAKE SHOE AND FOUNDRY COMPANY

THE BURLINGTON

On December 18th, the Burlington Twin Zephyrs, operating between Chicago and St. Paul-Minneapolis, were replaced by larger Twins. The basic construction of these new trains is the same as their predecessors. Built of stainless steel by Budd, the big Twins are seven-car, fully articulated, Diesel-electric-powered trains, each with an over-all length of 467 feet, 4 inches.

When the original Twins went into service on this run, their popularity was immediately apparent. So great was the demand for reservations

TWINS HAVE GROWN UP!

that, after the first six weeks, the schedule was doubled and each train made a daily round trip of 882 miles between Chicago and the Twin Cities. But it soon became evident that even this double schedule could not handle the traffic. Now the big new Twins, each with accommodations for over 200 travelers, are continuing the fine standard of service made by their predecessors. The smaller units have been assigned to other divisions of the Burlington Route.

Each of the new Twins contains, in addition to the power car, a cocktail lounge, two de luxe day coaches, a full-length diner, a parlor car with a private drawing room, and a parlor-observation lounge. Of course, all of the equipment, decorations and appointments are most modern.

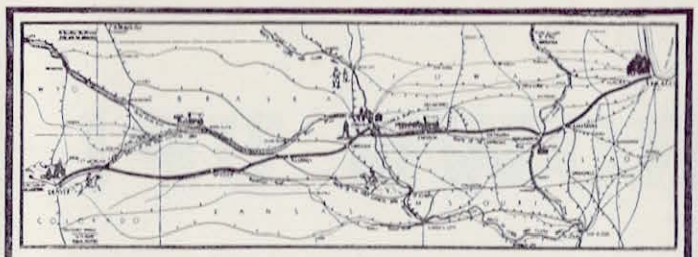
The addition of the new Twins increases the Burlington fleet of light-weight streamlined trains to eight. The Pioneer Burlington Zephyr, standard-bearer of the fleet, has completed more than 400,000 miles in revenue service. Each added mile that these trains travel . . . every extra penny that they earn . . . is further evidence of the value of the Budd SHOTWELD System of Light-weight Construction.

BUDD METHODS SAFELY ELIMINATE DEAD-WEIGHT

EDW. G. BUDD MANUFACTURING COMPANY

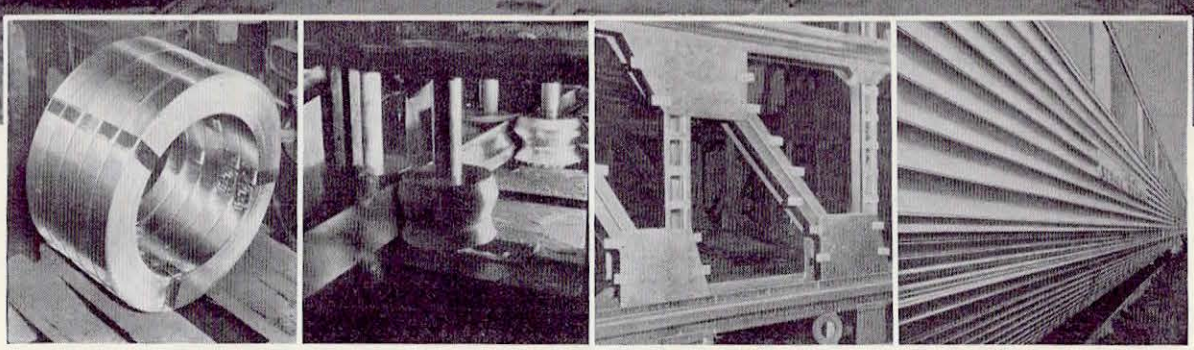
RAILWAY DIVISION, PHILADELPHIA

STAINLESS STEEL made



AVAILABILITY? *Look at this schedule! Each of the twin Denver Zephyrs makes a 1,039 mile run between Chicago and Denver every night. Such a schedule would not be possible without an extraordinarily high availability. The Burlington's records show that the original Zephyrs have been ready to make better than 95% of their scheduled starts!*

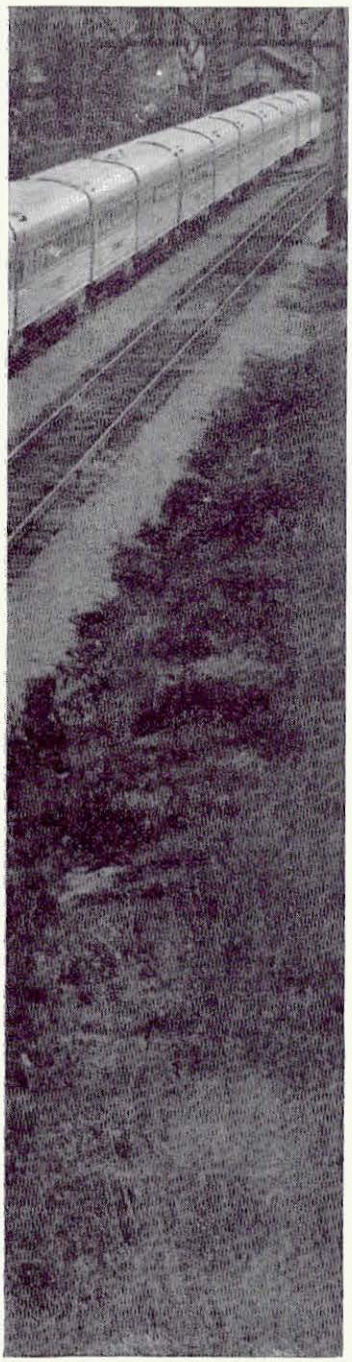
A complete, twelve-car, coach, diner and pullman stainless steel train—one of the two new Denver Zephyrs. Two additional new Zephyrs, the new seven-car Twins, go into service this month between Chicago and Minneapolis. They are the seventh and eighth trains this one railroad has bought in which USS Stainless Steel is helping to reduce weight, lower operating expense, attract additional passengers.



A B C D

LIGHTER *and* STRONGER . . . From COLD-ROLLED COILS to FINISHED TRAIN . . . this stronger, lighter construction is as plain as A, B, C! Coils of cold-rolled stainless steel strip (A) are quickly drawn through three pairs of rolling dies (B), emerge as angles, channels, "Z" sections, etc., which are then neatly built-up by "Shotwelding" into light-weight sections (C) of tremendous strength. The trusses are packed with highly efficient insulation; stainless steel siding is attached to the small tabs; and presto! The car (D) is structurally complete. Since there are no rivet holes (the small marks which look like rivets are actually "Shotwelds"), and since it is known in advance that there can be no loss of metal by corrosion, the full strength of the stainless steel can be used, every needless pound eliminated.

possible this *IMPORTANT*



Advance in Railroad Design

Important? Yes!
Why...? Because this Denver Zephyr is one of the newest trains[1] in all the world? Because this new train is one of the most luxurious[2] in all the world? Because this luxurious train has just bettered[3] an important world's record? Because this record-breaking train has an unusually brilliant and distinctive appearance? No.

None of these facts, important as they are, can compare with these two expectations based on the known performance of four earlier Zephyrs:

(1) Per train-mile, the cost of operating these brilliant full-length stainless steel trains is expected to be lower—by approximately half[4]—than that of equivalent conventional equipment.

(2) They are expected to attract capacity bookings for virtually every trip, and, roughly, 25% of these fares[4] will come from additional passengers who would otherwise not travel by railroad.

When new equipment is developed which will cost less to operate and at the same time bring in more revenue than existing equipment, we believe you will agree that it is unquestionably important.

Our hats are off, both to the Budd Company and to the Burlington Railroad for their brilliant achievement. Yet we respectfully point out that such trains would not be possible without high-strength, tarnish-proof stainless steel.

Make no mistake—Mr. Railroad Executive—no other commercial metal can give you complete immunity to atmospheric corrosion. No other metal of equal section can give you such strength, rigidity and long life under vibratory stresses.

That is why USS Stainless Steel makes possible lighter, stronger, more attractive equipment which never costs a cent for painting, looks "brand new" forever. That is why equipment made of USS Stainless Steel will not only cost less to operate but also attract many extra passengers.

In the face of these facts, isn't it poor economy to postpone the operation of attractive, light-weight stainless steel equipment on *your* road?

1. The first Denver Zephyr left Chicago on its maiden run in regular service at 5:30 P. M., November 8.

2. Connecting bedrooms with sliding partitions, private lavatories, inter-car telephone service, outlets for personal electrical appliances, showers for passengers and crew are only some of its many luxurious innovations.

3. On October 23, the Denver Zephyr ran 1,017 miles nonstop from Chicago to Denver in 732 minutes, bettering by 53 minutes the previous world's record for runs over 1,000 miles made in May 1934 by the original three-car Zephyr. In addition to the distance, it had to overcome nearly a mile in elevation gained.

4. Accurate cost studies on the original Twin Zephyrs covering 820,472 miles of scheduled operation indicate a train-mile cost of operation of 31¢ as compared with 70¢ for equivalent conventional equipment. An impartial survey among Zephyr passengers has indicated that 27% of their capacity bookings represent additional fares not diverted from other trains.

U·S·S STAINLESS STEEL

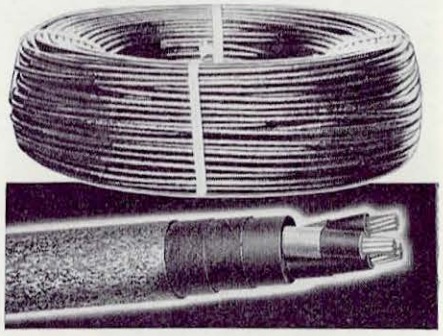
AMERICAN STEEL & WIRE COMPANY, *Chicago and New York*
CARNEGIE-ILLINOIS STEEL COMPANY, *Pittsburgh and Chicago*
NATIONAL TUBE COMPANY, *Pittsburgh*
Columbia Steel Company, San Francisco, Pacific Coast Distributors United States Steel Products Company, New York, Export Distributors

UNITED STATES STEEL

Carry on!

THE railroads are going places! Schedules are being speeded up! Loads increased! All of which places greater demands on all signal and power circuits. You'll find that you can secure consistent quality and performance by using American Steel & Wire Company Electrical Wires, Cables and Rail Bonds.

Our engineers have wide and varied experience . . . we suggest you take advantage of their "wire" knowledge before specifying and placing your next order.



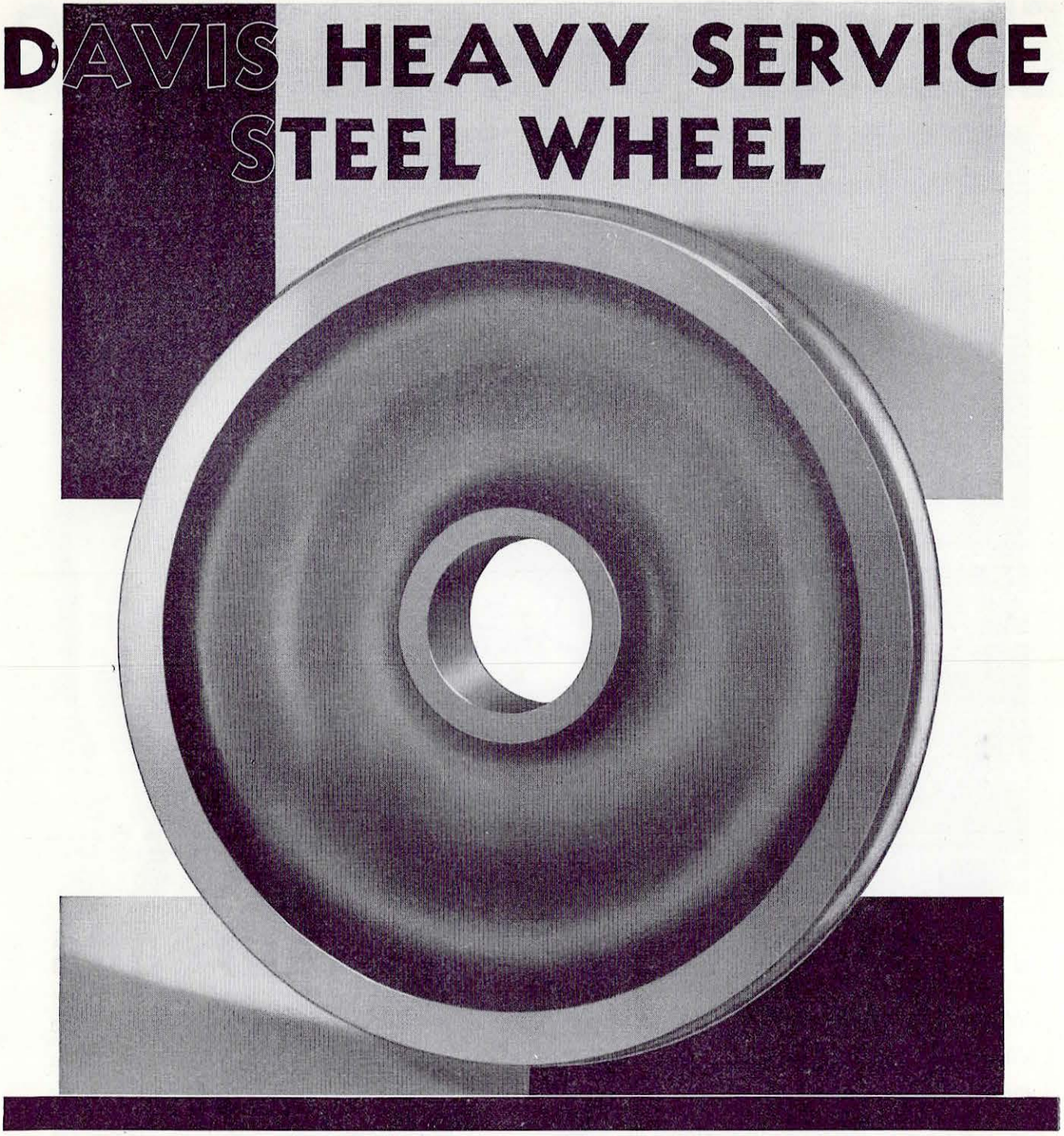
Rubber Covered Wires • Signal Wires • Locomotive Headlight Wires • Parkway Cables • Reliance U. R. C. Weatherproof Wires • Bare Copper Wires • Tiger-Weld Signal and Power Bonds • Perfected Telephone • Telegraph Wire and Strand • Tie Wires • Bond Wires • Aerial Cables • Trolley Wires

AMERICAN STEEL & WIRE COMPANY
208 So. LaSalle St., Chicago
Empire State Bldg., New York

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* • United States Steel Products Company, New York, *Export Distributors.*

UNITED STATES STEEL

DAVIS HEAVY SERVICE STEEL WHEEL



A multiple wear wheel for tender service.

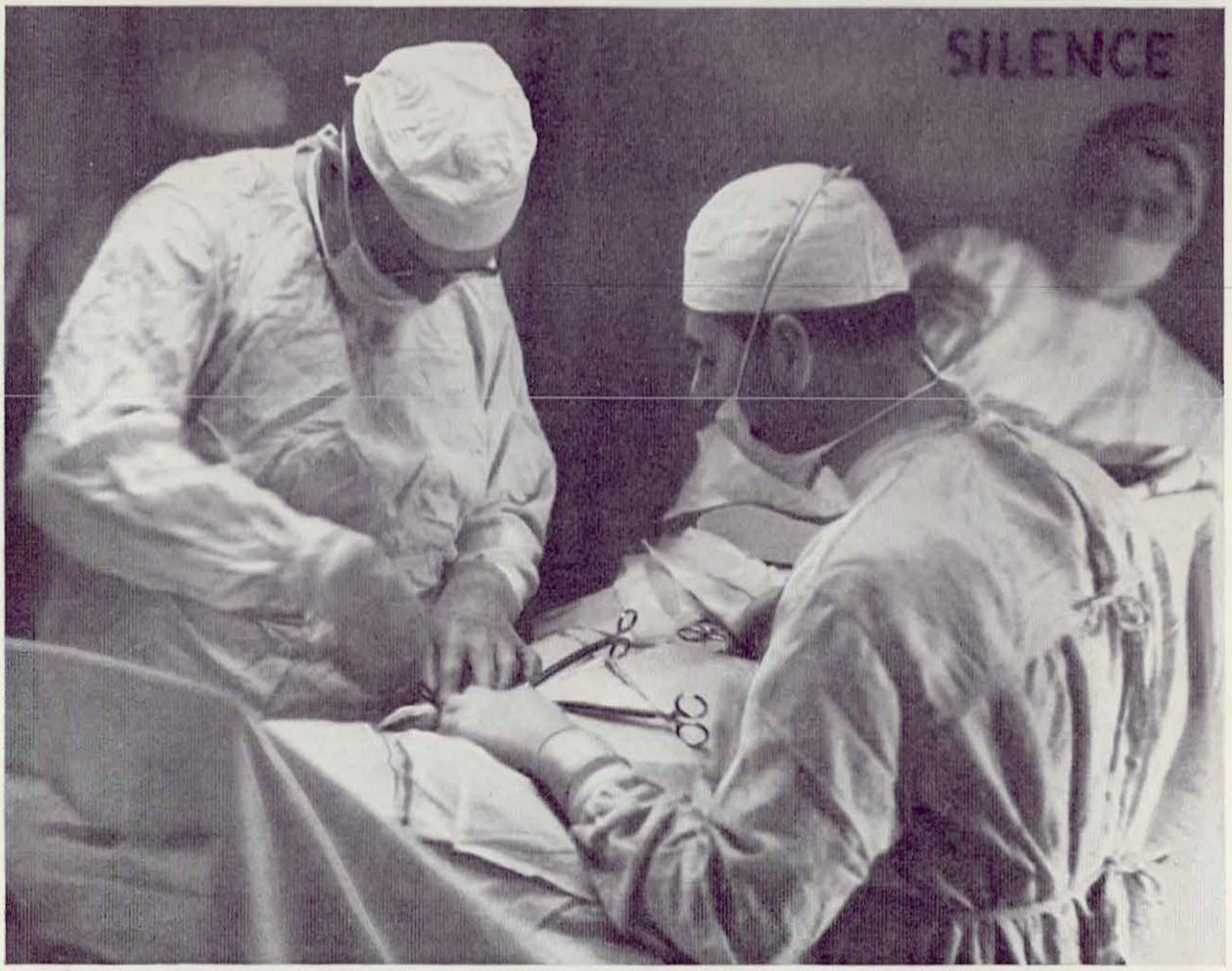
A wheel made of special composition steel, heat treated to produce a hard, tough, high tensile wear resisting tread.

A wheel that will practically eliminate shell-outs, brake burns and other tread disintegration defects caused by the heavy wheel loads and high speeds of modern locomotive tenders.

AMERICAN STEEL FOUNDRIES

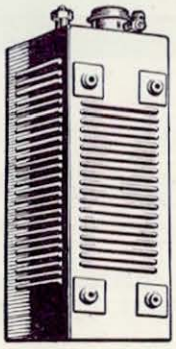
NEW YORK CHICAGO ST. LOUIS

EMERGENCY OPERATIONS



. . . out of place on railroads

When sudden battery failure cuts out air-conditioning and car lighting, the emergency costs money and makes trouble for all concerned. It's an unfortunate interruption in the road's good service. Or, happening in an industrial truck, it may cripple freight handling. "Give us batteries that do not fail unexpectedly," is the plea of car shop and maintenance men. Fool-proof batteries make their work easier, service smoother.



Just the opposite of ordinary batteries, the Edison Steel-Alkaline Battery will not suddenly "drop dead" on the job. Its life can be forecast in advance, accurately. Even toward the end of its life, it is not subject to unexpected failure. This is highly important with railroads because it keeps air-conditioning and industrial trucks reliable. In length of active service, Edisons outlive all other batteries . . . 2 to 5 times.

EDISON STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

The *better* the sheet the *better* the job it will do

THERE'S more to a steel sheet, black or galvanized, than how it works up on the job. It's the way it stands up in service that finally determines its quality. That's why wise fabricators specify sheets from a source of unquestioned reliability. It accounts for the national prestige and distribution of our Black and Galvanized Sheets.

The best metallurgical talent and facilities are considered none too good for these steel sheets. For uniformity, strength, ductility and finish these sheets conform to the exacting requirements of the most particular fabricators.

Our Black Sheets are available in varying degrees of finish, tenacity and other needed qualities. We have them for every known manufacturing need.

Our Galvanized Sheets not only have a fine steel base, run as close to gauge as the best mill practice permits, but have a zinc coating which assures satisfaction under the most trying conditions of fabrication and use.

Our metallurgists form a valuable link between plant and customers. They know metal requirements and how to meet them. We will be glad to discuss your sheet needs, advise the types best suited to your purpose.

CARNEGIE - ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham, Alabama*
COLUMBIA STEEL COMPANY, *San Francisco, California*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* — United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

NOW YOU CAN PAINT GALVANIZED SHEETS

EASIER, BETTER, MORE DURABLY!

Many attempts have been made to provide a galvanized sheet surface that would take and hold paint — hold it well and long. Some have been partly successful . . . others have failed. Now see how much farther Armco Paintgrip goes toward solving these problems. This greatly-improved paint-holding sheet was developed in collaboration with the Parker-Rustproof Laboratories and represents a distinct advancement beyond anything else heretofore offered to industry.

Perhaps its greatest advantage is a *full-weight pure zinc coating.* The fine-textured surface of Armco Galvanized Paintgrip sheets can be painted *immediately* with every assurance of a tenacious paint-bond. No more chemical etching, with its accelerated corrosion; no more prolonged weathering.

You know how vital it is to preserve the natural elasticity of the paint on a metal surface. Here Armco Paintgrip sheets have made a real conquest. Besides a good physical surface for mechanical adhesion, Armco Paintgrip insures a chemical neutrality *that definitely retards the drying out of paint's essential elasticity.* You will quickly realize the great importance of this feature. This means a much longer life than for paint applied to an etched or weathered surface.

These are the quick facts. Read more about the properties of Paintgrip in our new illustrated folder. Your copy awaits you. Just use the convenient coupon below or write us on your firm letterhead. And remember, we are ready to make the practical application of Armco Paintgrip to your express requirements. Armco Railroad Sales Co. Executive Offices, Middletown, Ohio. District Offices in all key cities.

OTHER ARMCO GRADES. There is a type and grade of Armco sheet metal to meet almost every conceivable requirement. No matter whether your demands are standard or for sheets of special analysis, you can choose the right grade of Armco Ingot Iron, steel or stainless steel to do the job. All are available in a full range of sizes, gages and finishes.

ARMCO, Middletown, Ohio
Send me copy of "Do It With Armco Galvanized Paintgrip Sheets."
We need paintable galvanized sheets for this purpose_____

NAME _____

COMPANY _____

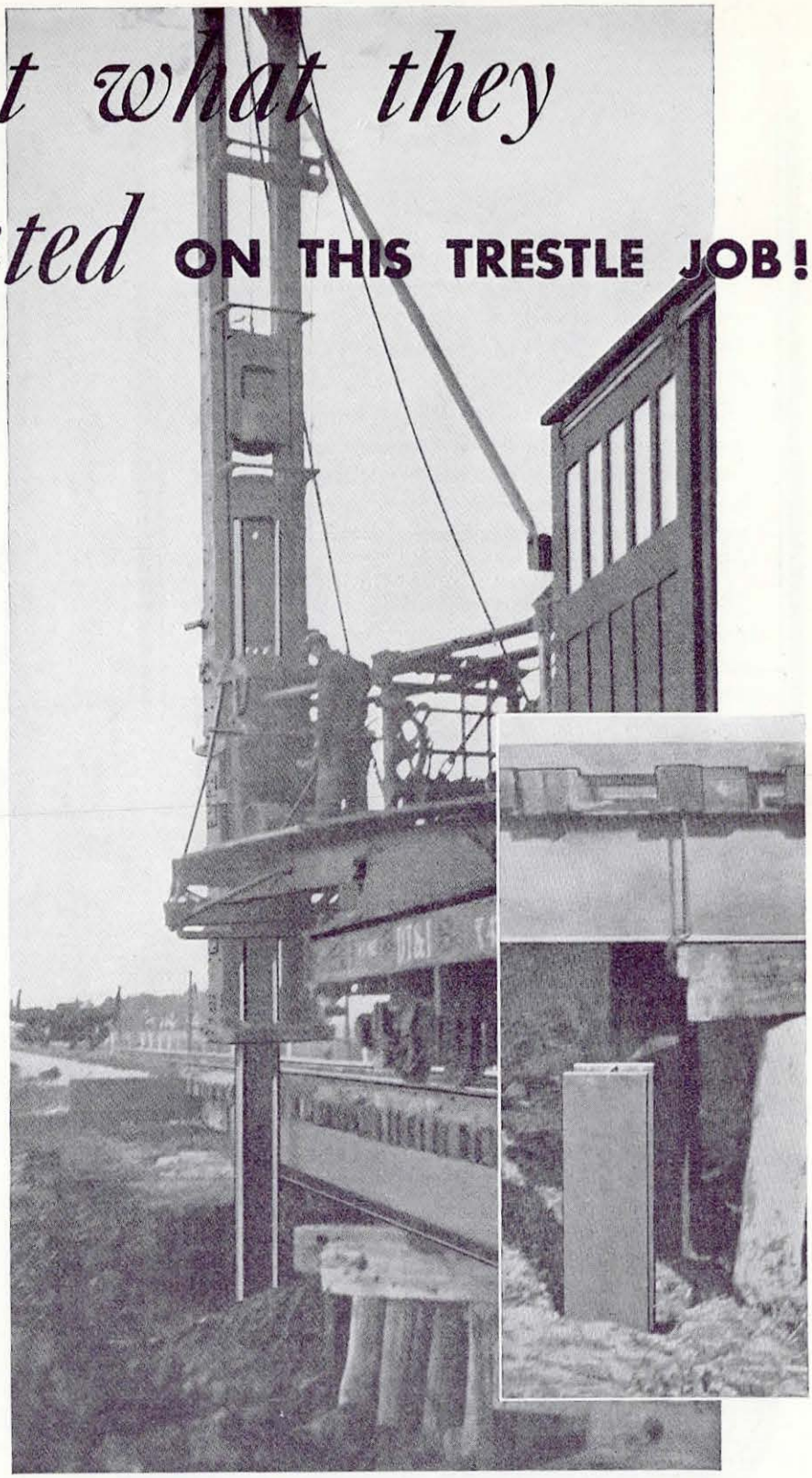
ADDRESS _____

RA 12-26

ARMCO
PAINTGRIP SHEETS

ARMCO

They got what they Wanted ON THIS TRESTLE JOB!



THE SITE: An old trestle near Hamler, Ohio belonging to the Detroit, Toledo & Ironton Railroad.

THE PROBLEM: To replace this old trestle at lowest cost, least disturbance to existing structure, and with no interruption to traffic.

THE SOLUTION: 14″ USS Steel Bearing Piles 28′ long were selected for the job. They were driven with a 2800 lb. drop hammer through 5′ of ordinary clay into 14′ of hardpan. No special equipment was necessary. All driving was done by the regular railroad maintenance crew. Today the bridge is reconstructed as a 19′ span, open deck type trestle, using steel stringers on a heavy concrete cap for E-70 loading. There are three steel piles to a bent thus giving about a 60 to 65 ton load per pile. The engineer makes this one significant point: At each bent it was only necessary to remove one tie to drive the steel piles. Thus, even though a complete job of underpinning was necessary, there were no other alterations or disturbances to the existing structure.

THE CONCLUSION: If your foundation problems demand that heavy loads be carried on individual piles—if the piles must resist lateral forces causing high bending stresses—if the trestle or bridge must be replaced without interruption to traffic, specify USS Steel Bearing Piles. They insure lasting and economical construction. Booklet, containing photographs of recent installations, free on request.

U·S·S STEEL BEARING PILES

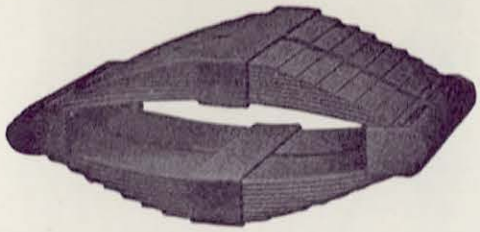
CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh *Chicago*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

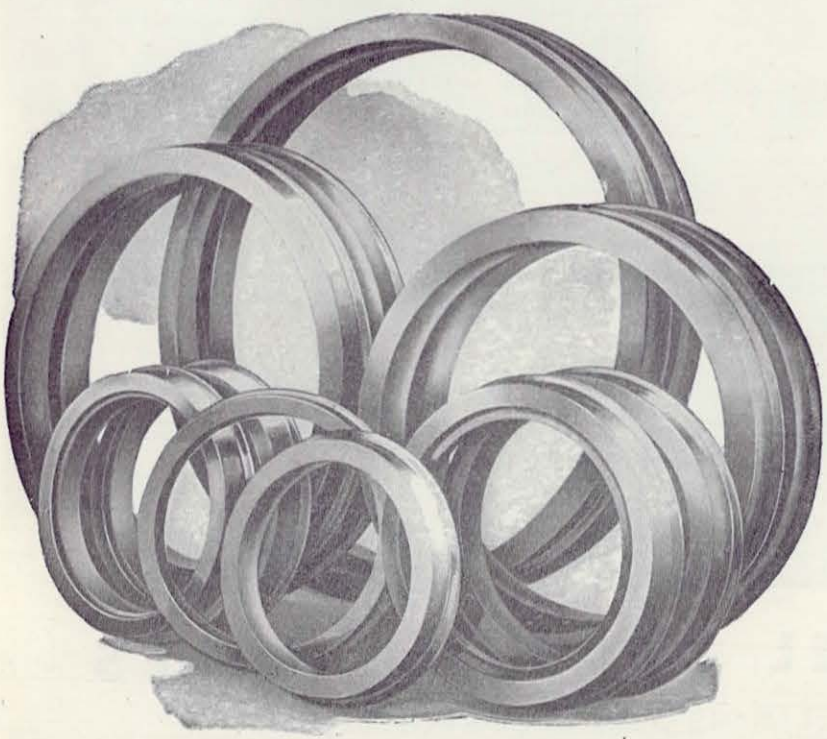


WHERE loads are heaviest—speeds the swiftest—and service most exacting—where dependability must be had regardless of severe conditions—railroads are turning to "Railway" Products for the stand-up-ability they possess.

"Railway" Tires, steel-tired Wheels and Springs are made to meet the particular requirements of service. From the slow moving, hard working switcher to modern high-speed streamlined locomotive and cars, "Railway" Products give maximum service and economy with minimum upkeep.

"Railway's" leadership is not held by length of service alone—but by an increasing desire to serve—and to make better "Railway" Products which were already good.

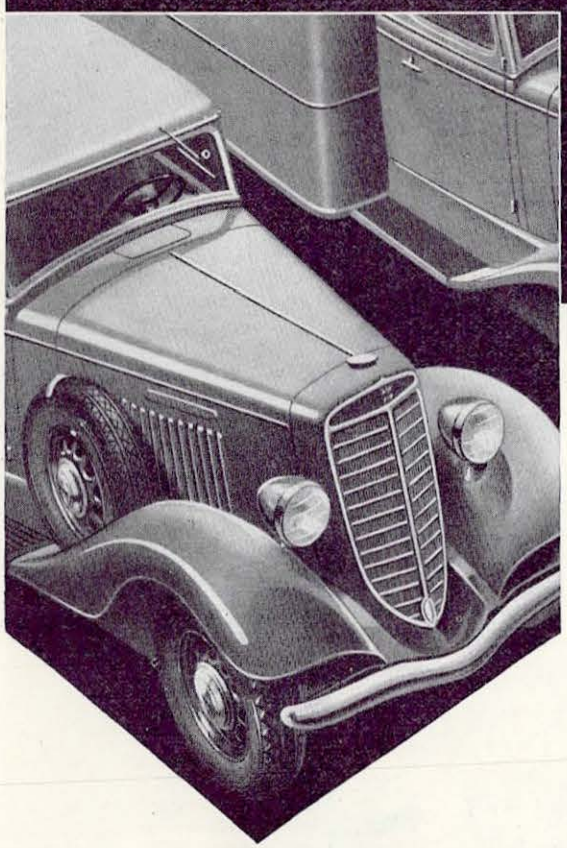
HEADQUARTERS *for* HIGH QUALITY TIRES-WHEELS SPRINGS *which Assure* LONGER LIFE *and* LESS MAINTENANCE



"RAILWAY"
"RAILWAY"
PRODUCTS

AMERICAN LOCOMOTIVE COMPANY
RAILWAY STEEL SPRING DIVISION
30 CHURCH STREET · NEW YORK · N.Y.

INTERNATIONAL TRUCKS



THE COMPLETE LINE

31 Models . . 91 Wheelbases

HALF-TON *to* SIX-WHEELER

INTERNATIONAL TRUCKS! There are 31 models in 91 wheelbases—all hauling needs are completely met with these trucks of six distinct types:

Conventional 4-wheel trucks in 14 models and 41 wheelbases.

Two-speed rear-axle trucks in 4 models and 14 wheelbases.

Dual-drive 6-wheelers in 4 models and 12 wheelbases.

Trailing-axle 6-wheelers in 5 models and 14 wheelbases.

Trailing-axle 6-wheelers with 2-speed driving axle —3 models and 8 wheelbases.

Cab-over-engine truck in 1 model and 2 wheelbases.

Quality trucks with a 35-year reputation, backed by dealers and Company-owned branches everywhere—a *matchless* service organization. Is it any wonder that men with every kind of trucking job come to *International* for trucks to meet their needs completely? All models available on easy time-payment terms at low rates. Ask for a demonstration.

Hydraulic brakes on all models except three heavy-duty units equipped with air brakes.

Chassis Prices **$415** *and up, f.o.b. factory*

When you come to International Harvester you can buy *just as much truck as you need.* Our representatives will not ask you to buy *more.* Your own judgment will tell you not to buy *less.*

INTERNATIONAL HARVESTER COMPANY
606 So. Michigan Ave. (INCORPORATED) Chicago, Illinois

Sturtevant *Pressure Ventilation!* with 4000 C.F.M.

REG. U. S. PAT. OFF.

AN EFFECTIVE SUBSTITUTE FOR AIR CONDITIONING WHERE EXPENSE OF AIR CONDITIONING IS NOT JUSTIFIED

MANY ROADS would like to take advantage of the proved traffic-building possibilities of air conditioning on short runs of suburban coaches and commutors' trains. BUT they feel that the expense involved in providing mechanical or ice refrigeration would not be justified.

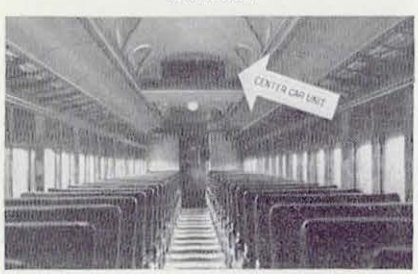
Sturtevant "Railvane" Pressure Ventilation has been developed specifically to meet this situation. It does not replace standard air conditioning . . . nor does it produce comparable results. But it does *very definitely improve* air and noise conditions in a car . . . to the point where passengers enjoy increased comfort and are fully conscious of it.

The first Sturtevant "Railvane" Pressure Ventilation System was installed in coach No. 4865 of the Grand Trunk & Western R.R. Results have been such that additional cars of this road have been similarly equipped. Other roads are now putting in initial installations.

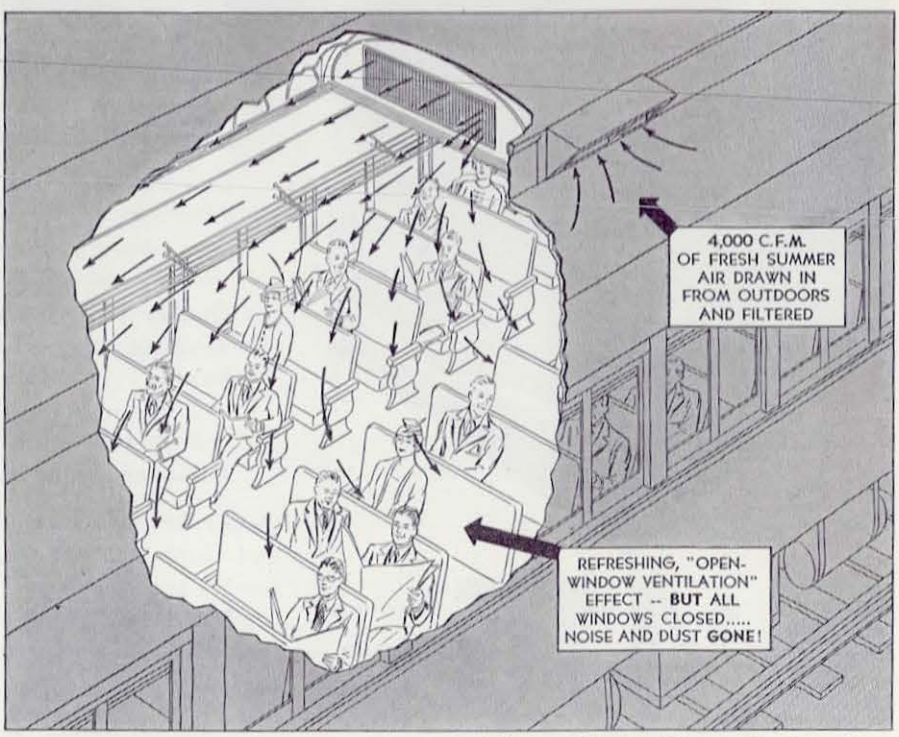
Outstanding advantages of Sturtevant "Railvane" Pressure Ventilation are:

1. Ventilates, filters, heats and distributes air.
2. Provides year 'round comfort.

Coach No. 4865 of Grand Trunk & Western R. R. First car to be equipped with Sturtevant "Railvane" Pressure Ventilation.

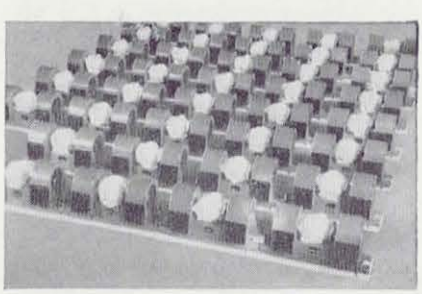


Interior of above coach, showing the Sturtevant Center-car air circulating unit. Air is discharged from grilles on opposite sides of the unit.


4,000 C.F.M. OF FRESH SUMMER AIR DRAWN IN FROM OUTDOORS AND FILTERED
REFRESHING, "OPEN-WINDOW VENTILATION" EFFECT -- BUT ALL WINDOWS CLOSED..... NOISE AND DUST GONE!

A Sturtevant "Railvane" Pressure Ventilation System with centrally located air distributing grilles. In the summer, 4000 cu. ft. of air per minute are drawn in from outside and discharged. A cooling, "Open window ventilation" effect is produced . . . but cinders and dust are banished; noise is greatly cut down.

3. Removes cinders and dust from air.
4. In summertime, completely removes tobacco smoke. In winter, partially dilutes it.
5. External noises are greatly reduced . . . because all windows and doors are kept closed.



A group of Sturtevant Air Circulating Units such as used for Sturtevant "Railvane" Pressure Ventilating Systems, ready for shipment to a railroad.

6. Assures uniform air distribution throughout car. Air distributed from centrally located discharge grilles or by distributing duct.
7. Can be combined with ice water or mechanical refrigeration to provide a system, under automatic control, which will operate as a pressure ventilating system in mild weather and as a standard air conditioning system in warmer weather.

Write to our nearest office for data . . . or ask our engineer at that point to call.

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Left view Zephyr coach

Right view Zephyr parlor car

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in speed and comfort

THE *comfort* of the new Twin Zephyr is as sensational as its speed, and Karpen is proud to share the honors. Installation of Karpen *seats* in *coaches*, *parlor cars*, and *cocktail lounge* of these marvelous new Burlington trains is impressive evidence of the efficiency and versatility of Karpen Transportation Seating Division.

Communication on seating requirements is solicited

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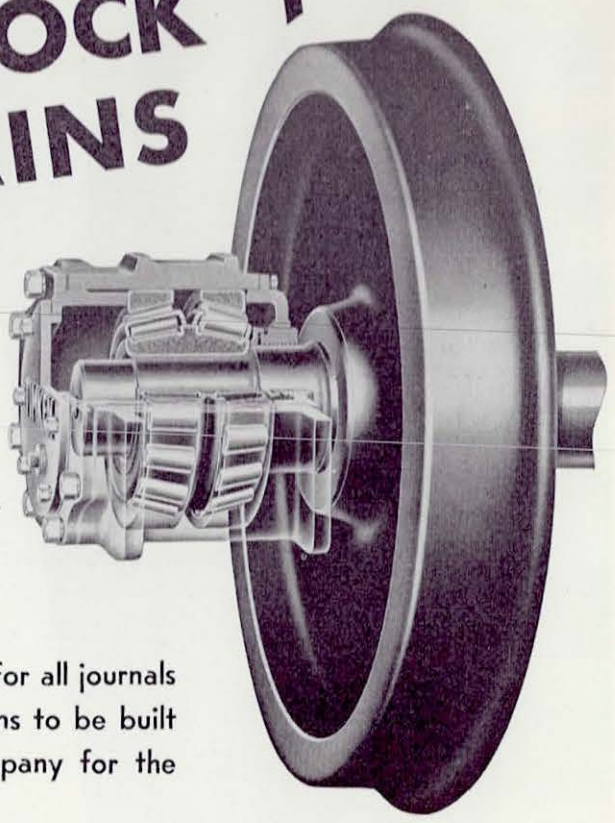
SIX NEW ROCK ISLAND TRAINS GO ON TIMKEN BEARINGS



Timken Bearings and boxes have been ordered for all journals of six light-weight, high-speed streamlined trains to be built by the Edward G. Budd Manufacturing Company for the Rock Island Lines.

The addition of these trains to the streamliners already in service on American railroads makes 23 trains completely equipped with Timken Bearings out of a total number of 28—over 82%.

The following is a complete list of the Timken-equipped streamlined trains built or ordered to date:

8—"Zephyr" trains, Burlington Route
6—trains on the Rock Island Lines
2—"Hiawatha" trains, Milwaukee Road
1—"City of San Francisco" train, Union Pacific R. R.
1—"City of Denver" train, Union Pacific R. R.
1—"Green Diamond" train, Illinois Central R. R.
1—"Mercury" train, New York Central System
2—"Rebel" trains, Gulf, Mobile and Northern R. R.
1—"Comet" train, New York, New Haven & Hartford R. R.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *TAPERED ROLLER* **BEARINGS**

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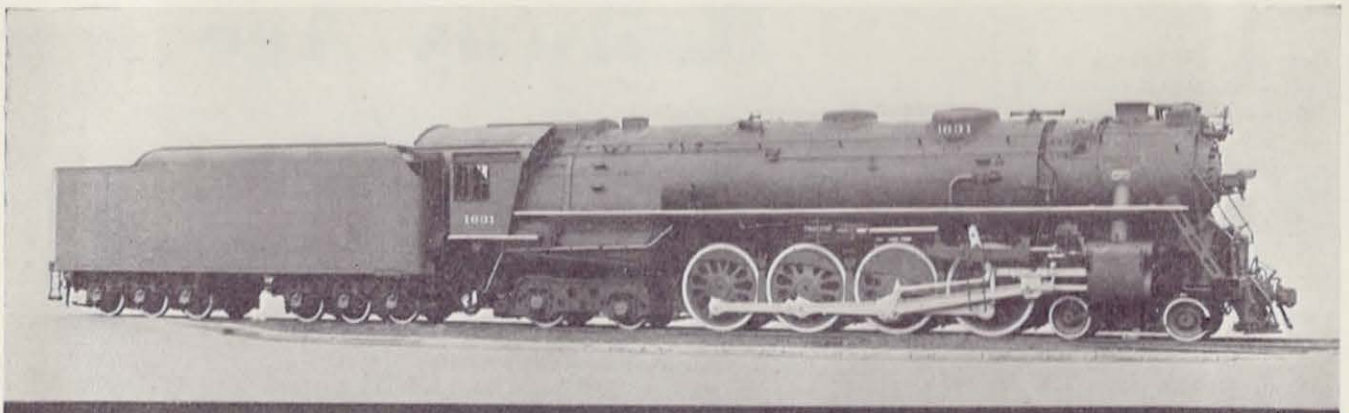

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THE No. 8-ET Equipment, applied to the most modern locomotives, is the satisfactory answer to the locomotive brake problem for steam and electrified railroad service . . . Its functional characteristics and operating advantages are completely disclosed in our Descriptive Catalogue 2052, a copy of which may be had for the asking. » » » » »

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GENERAL OFFICE AND WORKS . . . WILMERDING, PA.

The Week at a Glance

ADIEU SURCHARGES: Although Chairman Mahaffie and Commissioner McManamy believed that industry would fare better with continued railway buying which freight rate surcharges have made possible than from rate reductions, the majority of the Commissioners ruled otherwise. Many businesses, planning to increase their own prices, seem to think that the railroad rate level should move in the opposite direction to that of their own prices (as long as the latter is upward).

●

TERMS EXPIRE: The terms of Commissioners Eastman and Tate expire on December 31, but under the law as it now stands they will remain in office until they are either re-appointed or their successors have been named.

●

TRAFFIC TREND: It is primarily durable goods revival which is causing the marked upturn in freight traffic, an editorial herein points out. Loadings of the heavy commodities—lumber, coal, coke, ore—which are the raw materials of the durable goods industries, in the second half of this year are up from 19 per cent to 65 per cent over 1935.

●

3,900 FREIGHT CARS: The "steel roads" (Bessemer & Lake Erie, Missabe and Union) have ordered this total of gondola and hopper cars—this being the largest equipment transaction of the week, as reported elsewhere herein.

●

OIL LAMPS OUT: Trainmen's lanterns in Illinois—after the expiry of 60 days' grace—will have to be electric. The Illinois Commerce Commission issued its edict condemning the oil lantern for hand signaling on December 18.

●

WHEELER PROBE RESTS: The Senate inquiry on railroad finance has taken an adjournment until January 6. The session which ended last week consisted mainly of Senator Wheeler's efforts to show falsification of Mo. P. accounting in the Terminal Shares transaction—while railroad officers pointed out in refutation that they had used their best judgment on a technical question, so complex that the I.C.C. took a year to make up its mind as to proper procedure.

●

CARLOADINGS: The total for the December 12 week—739 thousand—was 19.8 per cent above last year and 3.5 per cent above 1930.

●

"LEGISLATIVE RATIO": The effectiveness of railroad legislative and public relations work in the various states can be compared as accurately as fuel or operating performance, the leading editorial in this issue contends. Comparative data are available, state by state, on the relative laxity or adequacy of truck regulation and taxation; as well as on other competitive matters in the realm of political action. It is suggested that these indices be given close managerial scrutiny with a view toward bringing inefficiency to light, and applying generally the methods which, in some states, have produced a favorable "legislative ratio." Good-will toward the railroads—in contrast with that toward unregulated businesses—it is further pointed out, can have little dollars or cents value unless means are provided to give it political effect.

●

PEACEFUL RAILS: The National Mediation Board is pointing with pride to the railways' freedom from strikes, in spite of the existence of many disputes which, without the machinery of the Railway Labor Act, might lead to conflicts. Whatever reservations one may hold with respect to the Railway Labor Act, it is anomalous that it should be applied to the railroads and not to competing transport agencies in which labor troubles are, as the saying goes, "rife."

●

SALES TRAIN: The Weyerhaeuser lumber people are going to have a convention of lumber salesmen on a Great Northern train next month. Cars have been provided for meetings while the train is en route—and it will make a 6000-mile journey, covering lumber production from start to finish. Looks like an idea which, laid before other industries, might develop some extra business for the railroads—and some new friends too.

●

BIGGER TWINS: The new and larger Twin Zephyrs of the Burlington, placed in service last Saturday between Chicago and the Twin Cities are described and illustrated herein. The trains have seats for 170 passengers, exclusive of lounge and bar seating arrangements; motors, 1,800 hp.

●

BRIDGE SAVINGS: In a paper abstracted herein R. P. Hunt, assistant bridge engineer of the Mo. P. outlines the field for economies in bridge maintenance and the renewal programs and types of structures by which such economies may be realized.

●

N. J. TAXES: 10 million dollars are at stake already in the New Jersey railroad tax case, decided adversely last week to the railroads. But this week the federal court gave permission to the carriers to reargue. The railroads' contention is that their property is assessed on a discriminatory manner by comparison with other property in the state. Jersey, noted for high railroad taxes, is equally noteworthy for its liberality in dealing with competing trucks.

●

BARGAIN MONEY: Money for new rolling stock and motive power (from the sale of equipment trust certificates) is cheaper now than it ever has been, and cheaper than any generation could reasonably expect to witness twice in its lifetime. Experts differ on how long the money bargains may last, but few would expect them to persist after a wholesale revival in industrial modernization—and consequent demand for capital—gets under way. Considering the railways' present equipment situation, the prevailing low interest rates are an almost providential tempering of the wind to the shorn lamb. Maybe they also constitute a great opportunity; but only hindsight will reveal that positively.

●

1,000 TRUCKS: In New York City alone the Railway Express Agency operates a fleet of over 1,000 motor vehicles in a remarkable collection and delivery operation which is not duplicated anywhere else in the United States; and is more thorough-going in its coverage than the operation of any other trucking enterprise. Twenty-six per cent of all Express Agency traffic originates in New York. Methods are described in an article herein.

●

FIGHT C. & D. MINIMUM: The Chicago Association of Commerce has petitioned the Interstate Commerce Commission to re-open the eastern collection and delivery case. The association is particularly opposed to the prescription of 45 cents per hundred as the minimum below which free c. and d. cannot be given. It contends that the record does not justify the prescription of any minimum.

●

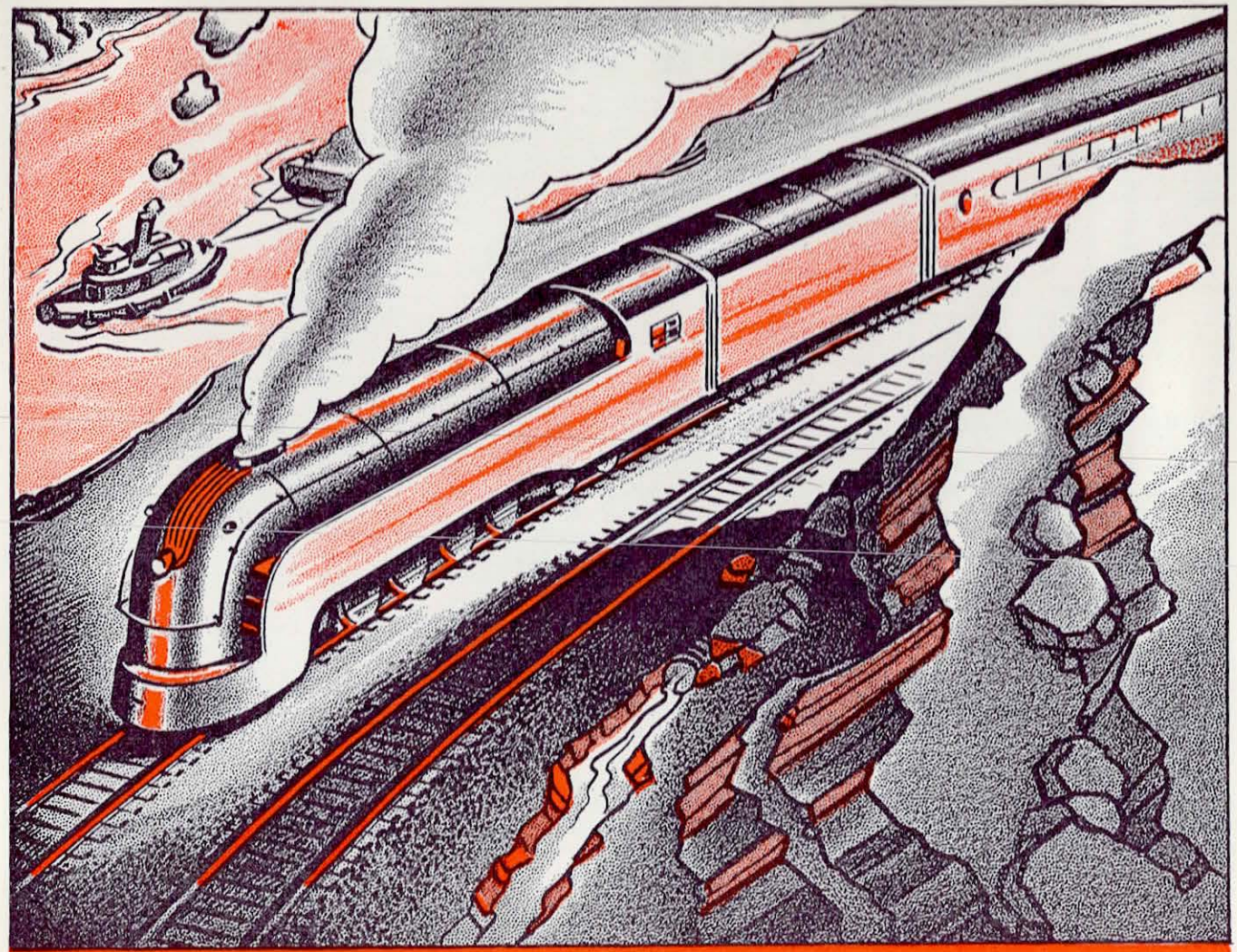
6-HOUR VICTORY?: George Harrison announced last week for the railway labor executives that 6-hour legislation would be introduced soon after Congress convenes and that "prospects are exceedingly favorable for its adoption." In view of the I.C.C. decision reducing freight rates, apparently everybody but the railroads themselves are all set to get more than all the increase in revenues which traffic revival is bringing. Blood, it would appear, is to flow from the turnip.

●

COACH-TOURIST TRAIN: The Rock Island and the Southern Pacific on January 3 will place in service between Chicago and Los Angeles a train, the "Californian," exclusively for coach and tourist sleeping car travel, with modern amenities—more comfortable seats, larger retiring rooms, low-priced meals, cars exclusively for women. On the same date the Golden State Limited will become an all-Pullman with a quickened schedule. The Southern Pacific's New Orleans—Los Angeles service will likewise be accelerated.

●

MODEL WATERWAY: The report of the Panama Canal comes as a welcome relief after the endless discussion of the "economy" of all other inland waterways. Here is a waterway which not only pays operating expenses, but the operators of which expect also to earn some interest on the investment. The Senatorial inquisitors who are so upset about a technical accounting disagreement on a particular railroad might profitably inquire into the reasons, if any, why the War Department does not make its waterway accounting practices in general agree with those of its principal waterway enterprise.



Greater Strength and Shock-Resistance

Modern locomotives, thanks to improved design and improved materials, are capable of developing from 25 to 35% greater horsepower capacity without increased driving wheel loads and within all operating requirements. » » » Agathon Alloy Steels provide the greater strength and shock-resistance that permit lighter weight forgings, yet prolong service life and reduce maintenance. » » » Agathon Staybolts have higher tensile strength to withstand the higher boiler pressures and reduce staybolt costs. » » » Toncan Iron for fireboxes, Agathon Nickel Iron for case hardened parts, Republic Double Strength Steel for lightness in streamlining — for every locomotive part there is a Republic Iron or Steel specially developed to meet the specific need. » » » Our metallurgists are at your call. Address Department RA. » » » » » » » » » » »

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REPUBLIC STEEL

Startling Contrasts Shown In Legislative Effectiveness

The railways are spending millions, and railway men are giving freely of their time and energy, to cultivate the good-will of the public. There is plenty of evidence that the effort is succeeding remarkably. But what are the *tangible results* of this good-will, built at such cost? Have the subsidies to railway competitors been reduced? Is there any recession in the construction of waterways? Are railway competitors subject to equivalent burdens of regulatory restrictions? In short: *Are the railways, as a result of the good-will they have created, noticeably better off than they would have been if they had saved themselves the effort and expense they have put forth?*

Good-Will Must Be Given Political Effect

That they are somewhat better off there can be no question. There have been some gains in passenger traffic, and perhaps some in freight as well, which they would not have had without their campaign to "sell the railroads." But the railways are not suffering primarily from a reluctance of the public to patronize them, but rather from restrictions of a political nature which prevent the public from patronizing them. Unless the good-will can be made to act on these political obstacles, then of itself it can have little dollars and cents value. Unless some more effective means can be applied than have so far been generally adopted to get the remedy to act at the seat of the disease, then maybe it would be wiser to spend less effort and expense on the medicine.

Let us consider an hypothetical, but typical, example: A business man, say, at St. Louis who has been patronizing the federal barge line solely on a basis of lower rates. The only costs that mean anything to him are the prices he has to pay, and the barge line, consequently, looks good to him. Then, let us assume, some time during the past year, he reads several of the many excellent articles which have appeared in popular magazines telling of railway progress. His interest is aroused. Streamlined trains are on exhibition at the Union Station. He inspects one, and takes his son along. Both are enthusiastic. The next time a railroad speaker comes to his service club, he attends and listens with sympathy and understanding to an analysis of the railroads' competitive handicaps. He reads and studies further—and eventually it dawns on him that his patronage of the barge line is uneconomic and unsound; that it means desertion of a more efficient form of transport for one far less efficient, and that this kind of "economy," if pursued to its logical conclusion, would bankrupt every private business and put the whole country in the poor house.

Handicaps Political, and Politics Alone Can Remove Them

Here we have a firm friend of the railroads, who has been made such by sales and public relations work. But does this good friend of the railroads take his business away from the barge line and put it back on the rails? He does *not*. And the reason he does not is that he has to meet the prices of competitors if he wants to stay in business. The only manner in which he can give tangible evidence of his friendship for the railways is through his political power—the railway handicap in meeting barge line competition being purely political. By himself, his political power is small. But what if scores and even hundreds of such friends of the railroads in every election district were known and could be called upon when a crucial measure to foster competitive equality was pending in Congress or the state legislature? So mobilized, and their honest opinions made articulate, the friends of the railroads would soon put an end to the railways' artificial handicaps; and traffic to which the railroads are economically entitled would come back to the rails. The sales and public relations efforts and expense would begin to have important *tangible* effects.

Is there any hope of their effectiveness, in anything like the proportion of the effort and expense, unless by some such method good-will can be given a political turn? Mr. Ford advertises his automobiles and people rush to buy them as a result, but there is no political barrier between the buying public and his product. He does not have the handicap of complex restrictions from which his competitors are free. Nor does the government pay a large part of the expenses of his competitors. They build their cars under substantially the same conditions that he does. If they did not, then his advertising would do his business precious little good.

A Valuable Asset Going to Waste

This discussion is perhaps elementary and obvious. Yet the fact remains that, in many, if not most, of the states in the Union the good-will of the public and even of railway employees is going largely to waste in its political aspect because no adequate machinery has been

set up to mobilize it—this in spite of the fact that the political power of this good-will is its most important aspect; and that expenditures made to achieve good-will are almost sheer waste unless it is given political effect.

There is another side to this situation. (There would have to be, else something more would have been done before this to correct it). The opposing arguments can be expressed in a few words. They go something like this: "We cannot call on our employees to help us with competitive legislation, because it would give them too much power and they would begin to slip over 'make work' legislation on us in consequence. We cannot call in the shippers to help us because a lot of them are shipping by waterway and truck; and, besides, we need their support against labor legislation."

There you have it! We can't do this and we can't do that—so we do nothing. But we can continue to hold on to our jobs by getting credit for killing a lot of "crank" legislation which would not have been enacted anyway, and being very mysterious about our "contacts" and the "influence" we have. Meantime the railways' competitors, geared to a newer day in legislative technique, continue to "get away with murder." The lobbyists for the labor organizations, many if not most of whom would be only too glad to join in a constructive co-operative effort to benefit the railways as well as themselves, lack the research facilities to do the job alone. Failing more constructive measures for bettering the condition of their members, and being under compulsion to show some results for the expense they entail, what is more natural than that they should press forward with restrictive "make work" legislation? Anyone who asks himself that question, and answers it honestly, will be bound to have more than a little sympathy for the labor lobbyists who usually are so roundly condemned. We do not, of course, contend that they are wholly social-minded by any means—but considering the impossibility of constructive action which many of them face through no fault of their own, who can wonder at the outcome?

Giving Legislative Spokesmen a Fair Chance

We are not criticising legislative representatives either. Occasionally they may be inefficient; but in any given state where legislative accomplishment is below par, the ability and integrity of the legislative representatives may, on the contrary, be very high. Perhaps the handicap is some railroad officer who, without real authority to do so, prevents a rapprochement with railroad labor and friendly shippers. Or maybe the railroad legislative committee is torn asunder within itself, and legislative spokesmen can take no positive action without offending some interests which would insist on their dismissal.

What we suggest is that railway managers study this problem exactly as they would fuel performance, or any other operating index—by a comparison of results. (There are few operating or maintenance details attention to which involve the revenue that this problem does.) A comparison, by states, of truck taxation and regulation is available. Look at the record, and if in any state traversed by your line the requirements are much worse than the best, find out why—and the same where the requirements are much higher than the average. Get to the bottom of all departures from the norm, just as you would if fuel or maintenance costs or locomotive failures were the subject of the inquiry. Often a seemingly bad record—just as in operating statistics—will turn out to be a good one when local conditions are taken into consideration; and vice versa. But a great many bad situations, we suspect, will be uncovered where no adequate excuse will be found.

Faulty methods and incompetent personnel in legislative work, as well as successful methods and able workers, can be brought to light by the same managerial analysis that has brought efficiency in railway operation to its present high standard. Considering the revenue involved in legislative efficiency or the lack of it, there is probably no phase of the managerial function of greater importance. And such analysis, and prompt and decisive action upon what it discloses, is the only possible means by which advertising and other good-will expenditures may be made to yield a full return.

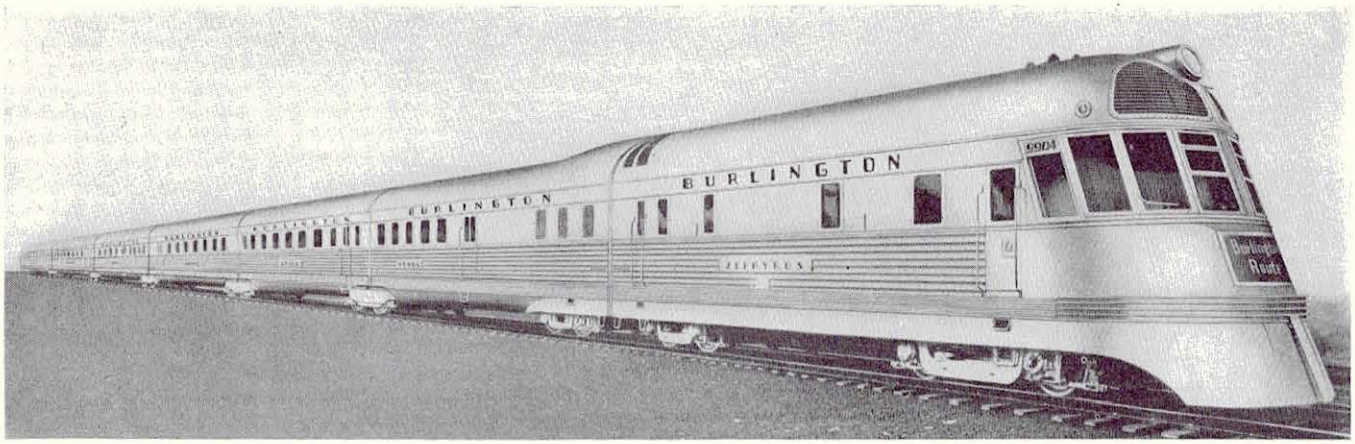
Significance of Facts About Freight Loading

Freight loadings have shown two notable tendencies during 1936. Total loadings have increased throughout the year at an accelerating rate; and loadings of heavy commodities serving as raw materials for the durable goods industries have increased relatively more than loadings of consumable goods.

Total loadings in the first half of the year were 66½ per cent as large as they averaged in the first halves of the five years 1925-1929, inclusive. Total loadings in the 24 weeks ending with December 12 were 71 per cent as large as in 1925-1929—a gain of 7 per cent more than seasonal over the first half of the year. In the first two weeks of December they were almost 80 per cent as large as they averaged in 1925-1929.

In the 24 weeks reported since the middle of the year the increases over 1935 in loadings of the various classes of commodities have been: Merchandise l.c.l., five per cent; grain and grain products, eight per cent; live stock, 13 per cent; forest products, 19 per cent; miscellaneous, 22 per cent; coal, 23 per cent; coke, 55 per cent; ore, 65 per cent.

No figures could better illustrate that production in the durable goods is gaining on production in the consumers' goods industries, and that production in the two classes of industries will soon be restored to the equilibrium required for full restoration of prosperity, if no measures retarding the progress of recovery in the durable goods industries are adopted.



One of the Twin Cities Zephyrs

Enlarged Twin Cities Zephyrs Placed in Service by Burlington

New trains of six body units built by Budd and hauled by E.M.C. 1,800-hp. Diesel locomotives provide revenue seats for 170 passengers, lounge seats for 42 and dining seats for 32

TWO new Twin Cities Zephyr trains were placed in service between Chicago and St. Paul and Minneapolis on December 18. Each of the new trains consists of a 1,800-hp. Diesel-electric locomotive built by the Electro-Motive Corporation and six fully articulated stainless-steel passenger units built by the Edward G. Budd Manufacturing Company. They replace the two three-unit articulated trains with which the Zephyr service was inaugurated between these cities in the spring of 1935.

Each train is made up of a combination power-baggage-cocktail-lounge unit, two coach units, a diner and two parlor cars, the rear of which contains a small observation lounge. The train has coach seats for 120 passengers, parlor-car seats for 50, including seven in the drawing room, seats for 10 in the observation room and card section of the rear unit, and seats for 32 in the cocktail lounge and annex of the first body unit. There are tables in the diner for 32 persons.

The Cocktail Lounge

The first unit is 76 ft. 3 in. long, 64 ft. between truck centers, and contains an engine room in which the train power and heating plants are housed, a small baggage compartment and a cocktail lounge with a bar. The baggage compartment is directly behind the engine room and separated from it by a partition. In it are placed a combination radio-phonograph, a storage locker for ice, beer and liquor, and an equipment locker.

The remainder of the first car is devoted to the cocktail lounge and cocktail-lounge annex, the arrangement of which is essentially the same as in the Denver Zephyrs.* The quarter-circle bar in the forward left-hand corner has a genuine mahogany top and a painted front face to match the rust-colored wainscoting of the car. The upper back bar consists of an edge-lighted peach-colored mirror, framed in stainless steel, and shelving for bottles. The lower back bar and the space below the working surfaces of the front counter are faced with stainless steel and are devoted to storage of ice, liquor and beer in mechanically refrigerated compartments.

Lounge seating accommodations consist of two semi-circular sofas and ten tubular stainless-steel-frame movable chairs. The tables are black Formica tops mounted on aluminum pedestals.

Directly behind the cocktail lounge and separated from it by an ornamental aluminum grille is placed the cocktail-lounge annex which is furnished with four facing pairs of double seats, each of which has a table. These tables are removable. Like the ones in the lounge proper, they are finished in black Formica.

The seat upholstery in this car is Eagle-Ottawa hand-buffed genuine leather, colonial-grain tan color. The flooring is evergreen linoleum with an inlaid design in the aisle.

The wainscoting and the bar front face are painted rust and the ceiling is painted in varying shades of peach,

Names of the Locomotives and Body Units of the Twin Cities Zephyrs

	No. 9904	No. 9905	
Locomotives ...	Zephyrus	Pegasus	
First unit	Apollo	Venus	Train power, baggage, cocktail lounge
Second unit ...	Neptune	Vesta	Coach
Third unit	Mars	Minerva	Coach
Fourth unit ...	Vulcan	Ceres	Diner
Fifth unit	Mercury	Diana	Parlor
Sixth unit	Jupiter	Juno	Parlor, lounge

* See the *Railway Age* for November 7, 1936, page 658.

Interior of One of the Coaches —The Double Reclining Seats in Each Coach Seat 60 Persons

the lighter shades at the top, the more intense directly over the windows. The side walls, between the belt rail and the upper window rail, are finished in gray Harewood. The window sills are finished in black hardwood, the venetian blinds are painted with a greenish-gray color with rust colored tapes and operating cords. The cloth window drapes are tan color, which harmonizes with the ceiling and wall colors and are striped with very narrow horizontal red stripes. All the metal trim on the car interior is of a uniform tone and presents a pleasing contrast against the painted and wood surfaces.

The car is lighted from overhead ducts, which furnish indirect lighting from concealed lamps, and by column lights in vertical fixtures on the pier panels and rear partitions which furnish diffused direct light. The bar proper is illuminated by concealed lights in an overhead cove.

The Coaches

The second unit is 64 ft. in length between articulation truck centers and comprises coach accommodation for 60 passengers with a women's lavatory on the left side and a men's lavatory on the right side between the forward end of the car and the step well at the side-entrance doors. These rooms have vitreous fittings. Luggage space is provided at the rear end of the car.

The passenger section contains 30 Karpen transverse double reclining seats which are 44½ in. wide over the arm rest and are fitted with rubber seat cushions. The center arm rests are designed to permit their being folded out of the way when not desired. The seats are also equipped with ash receivers which are placed in the seat backs accessible to the person riding behind. Provision is made for mounting tables between the facing pairs of seats at the forward end of the car. These tables are similar, though slightly narrower, than those used in the cocktail annex of the first car.

The color scheme of this car is cool but cheerful. The seats are upholstered in a bluish-green striped pattern plush. The draperies are light olive green. The roller curtains are sea green and the carpet is taupe. The wainscoting and the pier panels are painted a gray-green color, while the upper walls and ceiling are shaded cream.

The indirect lighting in this car is similar to that of the first car, but diffused direct lighting is furnished by Safety fixtures built into the underside of continuous bag racks which extend the full length of the passenger section directly above the windows. Luminator Spot Ray lighting fixtures are employed in the vestibules and corridors throughout the train.

The third car is a fully articulated 60-passenger coach. Essentially it has the same floor plan as the second car, but turned end for end. The seats are of the same design and so are the other appointments, but a change has been made in color treatment to produce a warm effect.

Weight of the Twin Cities Zephyrs by Trucks

	Weight, lb.
Leading truck under engine-room-cocktail-lounge car	73,200
Second truck, between cocktail lounge and first coach	64,520
Third truck, between the coaches	58,430
Fourth truck, between the coach and kitchen end of diner	71,240
Fifth truck, between diner and parlor car	65,490
Sixth truck, between parlor cars	63,430
Seventh truck	40,030
Total	436,340
Locomotive	222,520
Total, including locomotive	658,860

The seats are upholstered in henna with a two-tone striped pattern. The draperies are a golden tan. The lower walls are rust color, the upper walls and ceiling flesh color, and the floor is covered with mahogany carpet.

The Diner

The fourth unit is a dining car with a kitchen at the forward end. This is approximately 23 ft. long, as were the kitchens in the Denver Zephyr diners. The dining room seats 32 passengers, four at each table as in the Denver Zephyrs, but two tables smaller. The chairs are of wood construction upholstered in colored leather.

The color treatment varies in the dining cars of the two trains. In the one diner—Vulcan—the walls are

painted blue-gray, the vestibules are painted delft blue, and the ceiling is finished in a very light blue-gray. The curtains are pearl gray, the window sills are black hardwood, and the venetian blinds are light gray on the inside with silver on the outside. The chairs are upholstered in ivory colored, colonial grain leather. A buffet is placed on the center line of the car against the pantry partition, but facing toward the dining room. In this car it is finished in light gray with ivory trim and is surmounted by a blue mirror. This assembly, placed as it is, carries out the effect of being framed by the dining-room doorway when observed from the rear of the car.

The color treatment of Ceres, which is the diner of the second train, favors red and brown for its base. The lower walls are light chocolate with a shaded light gray-green color used on the upper walls and ceiling. The coloring varies in intensity to a very light shade in the center. The curtains are red, window sills are black hardwood and the Venetian blinds are terra cotta on the inside and silver on the outside. The floor is covered with henna rust carpet, bordered with peach, except in the aisle adjoining the kitchen which is covered entirely with peach color carpet. The chairs are black matte finish upholstered with red morrocco leather. The buffet adjacent to the pantry is finished in matte black and is surmounted by a peach colored mirror.

The Length of the Body Units and the Total Length of the Twin Cities Zephyr Trains

	Ft.	In.
First body unit, from face of front coupler knuckle to rear articulation center	76	3
Second body unit, between articulation centers	64	0
Third body unit, between articulation centers	64	0
Fourth body unit, between articulation centers	64	0
Fifth body unit, between articulation centers	64	0
Sixth body unit, from front articulation center to rear of body	75	5
Total	407	8
Locomotive	58	1
Total length, including locomotive	465	9

The kitchen range is coal fired and contains a charcoal grill. A steam table is placed adjacent to the range. There are refrigerators for ice cream, milk, meat, poultry and general provisions. There are sinks and large work tables. An item of interest is the lighting in the refrigerators which is operated automatically by opening the doors. The door at the rear of the kitchen is provided with an opening and a drop shelf to facilitate service to the forward cars.

The rear of the car is fitted with a steward's desk, a linen locker, a steward's locker and a bottle refrigerator. An American Automatic telephone system provides communication at the steward's desk with the bar and with the porter at the rear end of the fifth car.

The steward's equipment and all the kitchen and pantry equipment are faced with stainless steel with finish known as No. 4. The passageway adjoining the kitchen is lined with the same type of stainless steel, unpainted, since the finish itself is of unusual beauty.

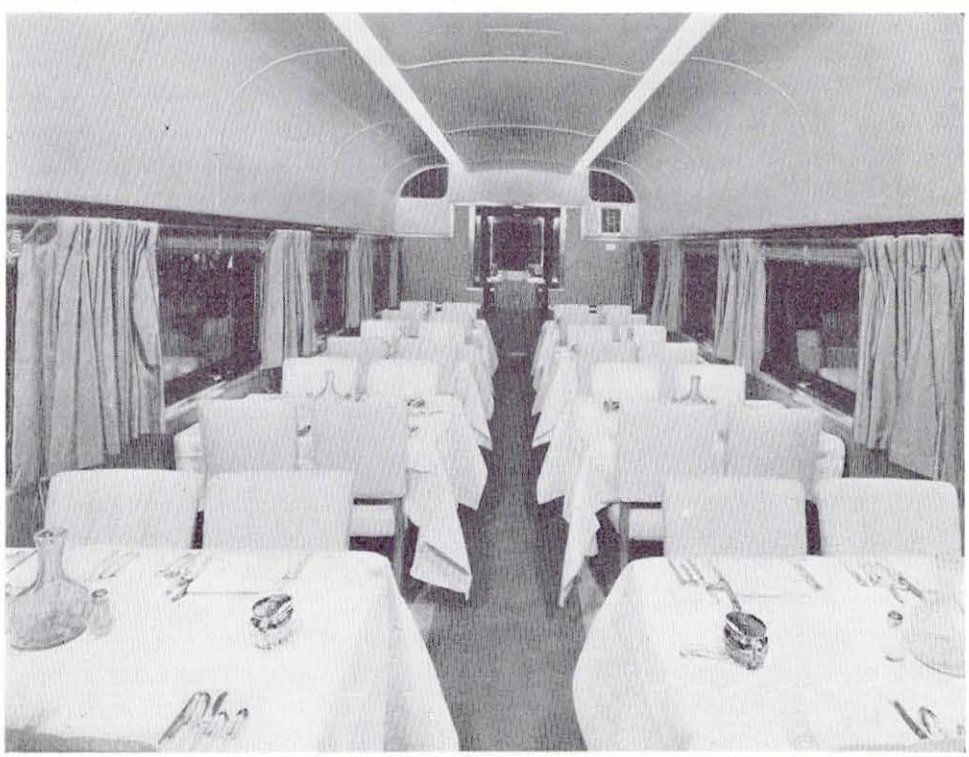
The Parlor Cars

The fifth unit is a parlor car 64 ft. between truck centers. The general seating of this car consists of 19 rotating Karpen parlor chairs located in the section to the rear of the side-door-step well. The chairs are furnished with rubber seats and are upholstered in a faun colored material. The lower walls are painted in cocoanut brown, the upper walls in sand, and the ceiling is finished in oyster white. The lighting is similar to that in the coaches.

At the rear end of this car is placed a drawing room in which no upper berth is provided. This is furnished with two transverse seats and a longitudinal sofa upholstered with rubber seats and covered with striped plush. The lower walls are painted with a light slate color, the upper walls are finished with figured flat-cut walnut veneer, and the ceiling is painted peach color. A circular mirror is mounted on the wall over the sofa, over which is placed a canopy light. General illumination is furnished by a ceiling fixture of special design.

A women's room is placed on the left side of the car forward of the step well and the men's room on the right. This equipment is similar to that in the coaches. A private lavatory room adjoins the drawing room and this is furnished with a hopper, a washstand and a dressing table.

A sixth unit is 75 ft. 5 in. long. The passenger



There Are Tables in the Diner for 32—The Tables on Both Sides of the Aisle Seat Four Persons Each

accommodations include 24 of the rotating parlor seats, six occasional chairs in the observation-lounge, and a card-playing section with a table and a pair of double transverse seats. The rotating chairs are furnished with rubber cushions and are upholstered in faun colored material. Four of the lounge chairs are upholstered in tan with a brown stripe. The seats in the card-playing section are upholstered in brown material with a lighter color striped design. The carpeting of the sixth and seventh cars is done in three colors. The field is rumba with the bands of Lido sand and and a center stripe of peach. The curtains in these two cars are red.

The overhead lighting duct in this car follows the car contour, extending from the forward end parallel to the side wall, makes a reverse bend in the observation lounge and returns on the other side of the car toward the front end. This duct is of the same cross-section as the indirect lighting ducts of the preceding cars. Bag racks extend from the forward end of the car up to the observation lounge. Safety lighting fixtures are set in the underside of these racks, the same as in the preceding cars. Directly above the windows in the observation lounge is placed a direct lighting cove which projects light downward and inward through diffusing glass.

Between the front end of the car and the step well are the lavatory rooms arranged and furnished in a similar manner to the preceding cars.

Dunlopillo rubber seat cushions are employed in all but one coach in each train. Mishawaka rubber cushions are used in this car. The upholstery was furnished by the Massachusetts Mohair Plush Company; the carpets, by L. C. Chase & Co.

Car Structures

The trains are essentially of the same construction and cross-section as the Denver Zephyrs recently delivered by the Budd Company to the Burlington. The cars are built of 18-8 stainless steel by the Budd Shotweld process, the material being cold worked to provide tensile strengths of either 100,000 or 150,000 lb. per sq. in., depending upon the relative demand for ductility or low weight and high strength. The sides are of Pratt truss structure with the roofs and the understructure serving as compression and tension members, respectively.

The end structures of the bodies are formed of steel articulation castings which extend into and are attached to the Lukenweld Cromansil needle beam and the stainless-steel center sill, as well as to the vertical beams extending to the roof on either side of the passageways. At the front end of the first car and the rear end of the last car the underframe structure consists of a Lukenweld Cromansil unit which serves as body bolster, side bearings, draft-gear housing, end sill and center sill. To this the stainless-steel center sills are securely riveted.

The passenger body units are insulated with flameproof Dry Zero applied in blankets to fit between the inner and outer walls. The side-wall material is 3 in. thick and the roof and end material 2 in. thick. The underside of the floor over the trucks is insulated with a corrugated layer of ½-in. Thermofelt which is retained and protected on the underside by stainless-steel sheets attached to the floor stringers. The under-body sheathing is insulated with ½-in. Hairinsul faced with Seisal Kraft paper. On the inside of the bottom hatches the Hairinsul is protected with Mulehide. Individual type Alfol applied in six layers insulates the baggage room and the engine-room sides and roof.

The side windows are of two thicknesses of Pittsburgh shatterproof glass with a dehydrated air space hermetically sealed between them. All sashes are inserted in stainless-steel frames fastened to the side frames with stainless-steel screws. The glass itself is cushioned from the frames by rubber.

The Train Power and Heating Plants

The engine room contains three 85-hp. 6-cylinder Cummins Diesel engines each directly connected to a General-Electric 50-kw., 3-phase, 60-cycle, 220-volt generator to produce current for the operation of train lights, bar refrigerators and air-conditioning equipment. The electric controls of the trains and the starter motors on the engines are operated on 32-volt direct current which is furnished by E. S. B. storage batteries. Under

One of the Parlor Cars—Rotating Seats for 43 Passengers Are Provided in the Two Cars

The Observation-Lounge at the Rear of the Second Parlor Car—The Card Section is at the Extreme Right

normal operating conditions the batteries are kept up to charge by a 1½-kw. generator mounted on each engine, but there is also provided a 5-kw. generator directly connected to a 220-volt a.c. motor which can be operated on power from the train line. The control circuits and electrical equipment are similar to those on the Denver Zephyrs.

Space is also set aside in the engine room for two vapor automatic oil-fired boilers, each with an evaporating capacity of 800 lb. per hour and operating at 200 lb. per sq. in. pressure. The fuel for the boilers and the Diesel engines is carried in a stainless-steel tank suspended between the floor structure and the under sheathing.

The Vapor heating system in these trains includes provision for returning approximately 75 per cent of the condensate from the radiators in each body unit to the supply tank. This system employs the standard type of Vapor regulator, in the connection above which is inserted a fitting by means of which most of the condensate is diverted to a sump underneath the car body. There is communication, however, between the radiators and the Vapor regulator so that the usual temperature control of vapor admission to the radiators is effected by the 25 per cent of the condensate which is wasted. Each of the cars, except the second, is provided with a sump. Under this car is located the main storage tank for the heating boilers and here the condensate drains directly into the main tank.

Each of the sumps under the other cars is provided with a float-actuated solenoid valve which operates to admit air pressure to the sump when full. By this means the water is blown from the sump into the main storage tank.

This water reclamation has made possible a material saving in weight. Storage is provided for slightly less than 6,000 lb. of water, whereas over 20,000 lb. would have been required had all condensate from the radiators been wasted.

Air Conditioning

The cars are fitted with Frigidaire air-conditioning equipment consisting of electrically driven compressors and condensers beneath the floor of the cars, with overhead thermostatically controlled combination heating and cooling units and blowers. The air-conditioning equipment is driven by 220-volt 3-phase motors and is controlled by low-voltage equipment. The air distribution is accomplished by openings in overhead ducts, located between a false ceiling and the underside of the lighting duct. Filtered fresh air for the air conditioning system is taken through openings in the sides of the car roofs. Side-wall radiators under thermostatic control are located close to the floor. The thermostatic control of overhead and floor heat and cooling equipment is similar to other installations on air-conditioned cars.

The kitchen ventilation comprises an air current to prevent kitchen odors from reaching the dining room and three large overhead exhaust fans. The air curtain, like that employed in the Denver Zephyrs, is formed by outside air taken through a grille opening in the roof side and directed across the doorway between the dining room and kitchen through a duct constructed on either side of the doorway. The kitchen exhaust fans are thus prevented from depriving the dining car of undue amounts of conditioned air.

The air in the cars is completely circulated once every two minutes, with sufficient fresh air taken in during the operation of the air-conditioning equipment to provide a change of air in approximately seven minutes.

The trains are equipped with electro-pneumatic modified HSC air brakes operated by air pressure supplied from the locomotive. The cars are equipped with retardation controls which function at four selected speeds and operate in conjunction with the speed-control governors. The communicating signal is electro-pneumatic up to the first car in which is placed a solenoid valve to reduce the pressure and to operate with the charged signal pipe on the locomotive. Push buttons are located throughout the train in vestibules and other necessary points.

A control box is concealed in the table at the rear end of the observation room which contains train-signal push buttons, a back-up control valve, switch for the back-up lights, and a valve for the back-up horn. An

(*Continued on page 947*)

Meeting Specific Problems in Bridge Design*

Greatest opportunity for improvement and economy is to be found in the refinement of the details of minor structures

By R. P. Hart

Assistant Bridge Engineer, Missouri Pacific, St. Louis, Mo.

Two Adaptations of the Three-Pile Concrete Bent

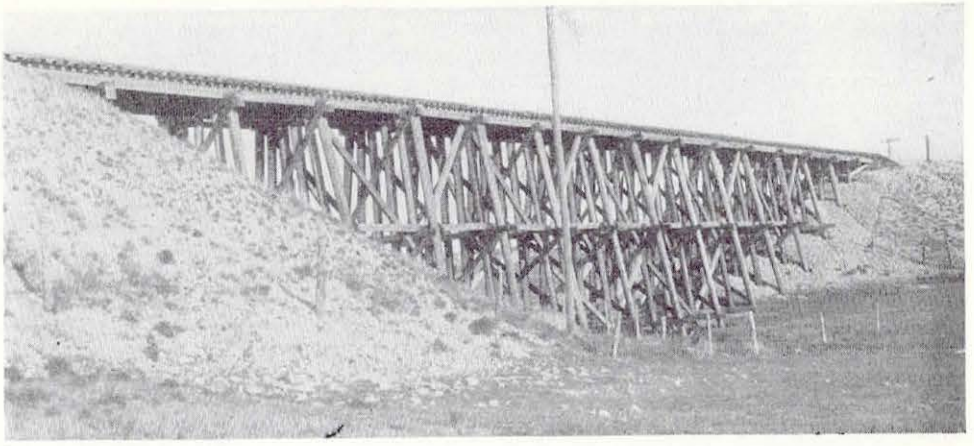
A STUDY of bridge renewal programs will demonstrate that the greater part of the work deals with the smaller and more ordinary types of bridges, such as timber trestles. When considered in the aggregate, these small bridges become our chief concern, though they may be most easily neglected when considered individually. As the timber trestle approaches the end of its service life there comes a time when it can no longer be maintained economically. Therefore, each bridge must be carefully considered from this viewpoint or available funds will be wasted, either in excessive maintenance or through extravagant reconstruction. The heavy burden of maintenance on our ordinary structures is continually before us, so that we are ever seeking a reason or an excuse to replace the old bridges with new ones. We seem to feel that when new bridges are built we will be relieved of our burden of maintenance. But does this give us all of the relief that we expect? The answer lies largely in the type of structures that we build.

Smaller Structures Important

In view of the imposing volume of ordinary bridge reconstruction to be done it is to be expected that we should think of our improvement programs in terms of blanket items covering the replacement of so many linear feet of bridge structure. For the sake of simplicity and uniformity we plan our work in conformity with certain adopted standards, and the magnitude of the program is likely to cause us to lose sight of individual bridges and the peculiarities attending their reconstruction or replacement in some other form. It is for this reason that the standards that we adopt should satisfy all of the requirements of correct design and that they be made sufficiently comprehensive for adaptation to the various situations to be met in the field. In some measure, the tendency has been to slight the work of preparing plans for ordinary bridge construction, even though the aggregate cost of this kind of work may far exceed the cost of a few special projects for which we prepare very extensive plans. It would seem quite as important to prepare proper plans for one hundred thousand dollars worth of ordinary bridge work as to design properly a single bridge structure that is expected to cost an equal amount. If a mistake is made in the design of the single structure, very probably it will not be repeated, but mistakes made in preparing standard plans result in endless repetition of improper or uneconomical construction in the smaller bridges.

For many years the railroads continued to build and rebuild trestle bridges along the same general lines first adopted and used. Several piles were driven to a bent and the caps and bracing were applied with only one bolt to the intersection. If a pile decayed at the ground line or under the cap it was replaced with a post, leaving the bent in a weakened condition. When it became necessary to redrive the bents it was necessary to do considerable re-arranging of the timbers in the old bridge

* Abstracted from a paper presented before the convention of the American Railway Bridge and Building Association.



If Proper Attention Is Given to the Details, the Timber Trestle Will Be With Us for Many Years

in order to drive the new piles to specified spacing. This was not only expensive but often resulted in annoying delays to traffic.

As engine loads became heavier and train speeds were increased it became necessary to increase the size or number of stringers and also to move the bents closer together to reduce span lengths. Then difficulty was encountered with crushing caps, due to heavy load concentrations on the bents. Such difficulties were discouraging and led to a search for more permanent types of construction, but even the first concrete trestles were designed with five or six piles to the bent, with attending difficulties and high costs of driving them under traffic. Some further change was necessary in order to develop a more permanent type of structure which could be built with less interference to traffic and more nearly compete with timber trestle construction in cost.

The Three-Pile Concrete Bent

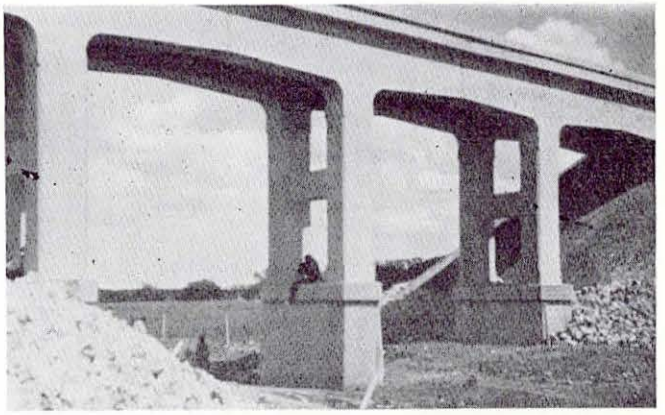
It was to satisfy these requirements that the Missouri Pacific, in 1932, developed and introduced concrete pile bents composed of three 24-in. octagonal piles with various types of accompanying superstructure.† The three-pile bent provides for the driving of one pile between old trestle chords and one outside of each chord, so that driving entails little disturbance of the old bridge. This results in lower cost of new construction, as well as less maintenance on the old structure and reduced interference with traffic during the construction period. The caps are cast in place at low cost by using sectional forms supported upon steel angles clamped to the piles and by placing the concrete with a portable mixing plant. The piles as well as the slabs are precast at a centrally located storage yard where high grade concrete aggregate and ready-mixed concrete are available. Since late in 1932 the Missouri Pacific has driven nearly 5,000 of these large piles and about 5 miles of ordinary timber trestles have been replaced, utilizing large piles in some manner. They have been used in trestle bents, for foundations and as precast column sections for high bents.

Certain other railroads are experimenting with three-pile bent construction and the savings to be effected through its use make it relatively certain that ultimately we will see much construction embodying duplicate or similar features of design. This is not claimed to be the last word in design and further improvements may be expected. Developments along this line may have been retarded because of the special equipment required to drive large piles. Although the first cost of this driving equipment seems rather high, it actually amounts to only a small fraction of the cost of the piles in place when distributed over several thousand linear feet. Much of the equipment may also be used for other purposes if not required continuously for bridge construction.

Special Problems

While the 24-in. concrete pile is advocated for more or less general use under ordinary conditions, there are situations to which it is not suited or to which it can be adapted only in modified form. When driven to rock foundation through shallow or soft overburden, the tapered points should be cut back to provide a larger tip, so that allowable unit bearing stresses will not be exceeded at the point of the pile bearing on rock. If the overburden above rock is quite shallow it may be necessary to set the piles in place and cast a footing around their points or replace them entirely with a properly designed concrete frame bent. There are other situations where it is necessary or desirable to construct collars around the piles at ground level, or to use double bents, in order to provide a structure with sufficient rigidity and meet specification requirements.

The matter of span lengths is something which can be decided only in the light of economics and the characteristics of the location. From the viewpoint of economy two things are very important. In the first instance, the cost of the substructure should equal the cost of the superstructure; that is, the cost of a single bent in place should equal the cost of a single span in place. Second, the span lengths should be such as to permit placing the substructure units clear of existing construction so that falsework and extra maintenance on the old structure may be avoided. Obviously, it is not economical in first cost to build high trestles using short spans or to use long spans in low bridges. Often, however, we find it necessary or desirable to waive this re-



The Rigid-Frame Is Particularly Suitable Under Certain Conditions

† A detailed account of the development of the three-pile concrete bent was published in the issue of February 10, 1934, page 220, while a second article, covering the various applications of this construction on the Missouri Pacific, appeared in the issue of December 14, 1935, page 782.

quirement of economics and utilize spans of lengths suited to the characteristics of the channel crossing. For an efficient waterway the substructure units must form the least possible obstruction to stream flow.

Concrete Slab Spans

It is apparent that the three-pile bents are particularly adaptable to many situations encountered at ordinary trestle bridges. They can be used with concrete slab spans 15 to 19 ft. in length and with steel beam spans 20 to 27 ft. long, so that new bents may be located to avoid old bents and pile stubs. Where conditions warrant, there is little, if any, objection to varying the length of adjacent spans in the same bridge in order to avoid interference with previous construction. Where the stream crossing is at an angle, the bents can readily be constructed on a skew to fit the angle of crossing, thus providing a more suitable waterway but without loss in rigidity of the structure. If the flow of water extends up to and around the concrete caps the ends of the caps may be rounded or streamlined to offer less resistance to flow. This, with longer length spans and the absence of bracing, further increases the efficiency of the waterway.

Should height of structure or stream conditions demand the use of longer spans the requirements can usually be met with wide-flange rolled beams. These beams lend themselves to simple and inexpensive fabrication and can, of course, be cut to form square or skewed spans of various lengths to suit the needs of the purchaser. One problem faced by the designer in connection with the use of such beams is the liberal tolerance allowed at the rolling mills. The depth of beams varies to such an extent as to require the use of sole plates of variable thickness in order to maintain a uniform depth from base of rail to top of bearings. Unless specifications definitely prohibit, the beams may also be furnished with reverse camber and twisted flanges.

With the present day tendency toward higher speeds of trains it is necessary to see that spans to be fitted with open decks are so fabricated as to provide a uniform track surface. Some structural shops have not been as careful as they should be in fabricating camber into plate girder spans. In multiple span bridges where longer spans are required, excess camber may result in unsatisfactory track surface over those bridges. It is therefore suggested that the designer specify both the minimum and the maximum camber permissible in preparing stress sheets or shop details for beam and girder spans with open decks. On ballasted deck spans camber may, of course, be neglected.

Steel Piles

Discussion of steel spans leads us to think of the possibilities of using steel piles. To date their use has been more or less limited, but there are now being rolled more suitable sections for three-pile bent construction to accommodate railroad loading and it is probable that we may see them used more generally in the future. They are suitable for use where the ground above rock or hard shale foundation is extremely hard or consists of compacted gravel or soft shale, thus making it difficult or impracticable to drive concrete or wood piles, which must displace a considerable volume of the soil. In some of these cases it is essential to drive the piles through the soil or gravel to the rock foundation because of the hazard of subsequent erosion of the stream bed. It is not difficult to accomplish this with steel piles because their cross-sectional area is small, and when driven with a suitable hammer they will cut their way through even comparatively hard shale. Some steel piles have been driven where they were depended upon to carry their loads through surface friction only, but they seem best adapted to a situation where they can be driven to rock through considerable overburden and carry the necessary load as a column, with the points bearing on the rock and the body of the piles receiving some lateral support from the surrounding soil. Deterioration of piles by rust, particularly at the ground line, should be carefully guarded against by jackets or collars of concrete, or by providing some suitable surface coating.

From the foregoing it might be assumed that timber trestles are no longer considered suitable for ordinary bridge reconstruction. Nevertheless the timber trestle has its place and if proper attention is given to the details of its construction, we are sure to have it with us for many years to come. Fastenings should be improved to provide more stiffness in the structure and certain structural weaknesses should be remedied. To make the timber trestle comparable with concrete and steel bridges in load-carrying capacity the cost will be considerably increased, but this must be done if it is to survive. Heavy loading and high speed will demand it.

The Rigid Frame

There is a rather special type of bridge construction that deserves mention in this discussion, namely, the concrete rigid frame. Structures of this kind are particularly suitable for use where the maintenance of traffic is not an attending problem, as for example, in construction on new alinement or where traffic can be routed over a detour track. I have recently had occasion to examine some small structures of this type built in 1930. After being in service for six years under heavy traffic moving at high speed they give every promise that they will continue to render the same service as long as the railroad remains in place. No flaw or weakness has developed in any one of them. These particular structures were built in sections, with construction and expansion joints suitably located to permit each unit to yield to change in temperature without placing excessive stress in any of the members.

This type of construction is well adapted to bridge ends for a steel span structure. Instead of constructing a massive abutment with long, high wingwalls to retain the embankment, the rigid frame can be located in the end slope of the embankment where it is largely relieved of the horizontal thrust from the fill and obviates difficulties with drainage or an unstable embankment. Rigid frames or open-type abutments are particularly suitable for grade separation work, because the open approach has the psychological effect of increasing the apparent size of roadway opening and gives a greater sense of security to the user of the highway. However, it must be admitted that the rigid frame becomes difficult or impracticable to build where railroad traffic must be maintained over the site.

A SALES CONVENTION that will travel 6,000 miles by special train will be operated by the Weyerhaeuser Sales Company, over the Great Northern on January 4-23. A special train, chartered from the Great Northern, and consisting of 12 cars, including 6 Pullmans, 2 dining cars, observation and office cars, and a coach in which sales meetings will be held, will be operated from St. Paul, Minn., to the Pacific Coast in order that Weyerhaeuser salesmen, who work in all sections of the country, may visit the forests from which come the lumber products that they sell; may witness logging operations in the Pacific Northwest, and see every step of the manufacturing of the company's products in its mills in northern Minnesota, Idaho, Washington and Oregon.

Senate Inquirers Take Holiday

Missouri Pacific accounting for purchase of terminal property criticized

WASHINGTON, D. C.

HEARINGS in connection with Senator Wheeler's investigation of railroad finance were brought to a temporary conclusion on December 18 when an adjournment was taken to January 6. This was after the Senator had devoted most of the last three or four days of the sessions to efforts to reinforce by detailed cumulative evidence his charge that the Missouri Pacific, under direction of the Van Sweringen management, had deliberately falsified its accounting for payments on contracts to purchase terminal property at North Kansas City and St. Joseph, Mo., on its books and in reports to its stockholders, the Interstate Commerce Commission, and the Reconstruction Finance Corporation.

Extent of Missouri Pacific Liability

The property was to be purchased from Terminal Shares, Inc., a subsidiary of the Alleghany Corporation, at a price of over $20,000,000, subject to approval by the Interstate Commerce Commission as to certain railroad properties included, but under contracts under which the Missouri Pacific was to be liable for any damage which the owners might sustain upon a subsequent sale if the acquisitions were not approved.

Additional details also were brought out regarding financing of the Van Sweringen companies by J. P. Morgan & Co.

It was charged that the Missouri Pacific payments were recorded in such a way as to make a better showing for the railroad and to cover up the extent of the liability it had assumed. There was also the suggestion that the property had been "unloaded" on the Missouri Pacific by the Alleghany Corporation after its value had fallen, although it had been testified that it had been acquired in the first place for the benefit of the Missouri Pacific while the Alleghany Corporation was still acquiring Missouri Pacific stock with the proceeds of securities based on stock of the eastern railroads. Commissioner Eastman and the Reconstruction Finance Corporation took the same view of the matter as Senator Wheeler did, while officers of the railroad defended what had been done on the ground that on a highly technical question of accounting they had used their best judgment under the accounting rules of the commission.

They also pointed out that it took the commission's Bureau of Accounts over a year to make up its mind as to how the transaction should be accounted for. On the other hand Senator Wheeler presented evidence in the form of letters taken by his investigators from the companies' files in an effort to show that the company had withheld complete information from the commission.

Jones Outlines R. F. C. Loans

Jesse H. Jones, chairman of the R.F.C., who appeared as a witness on December 17, read from a letter addressed to Senator Wheeler in reply to his inquiry, saying that the corporation had authorized five loans to the Missouri Pacific, aggregating $23,134,800, three in February and March, 1932, one in January, 1933, and one in February, 1933. Included in the original application for a loan of $23,250,000, presented to the corporation on February 9, 1932, was a balance sheet of the borrower as of November 30, 1931. This balance sheet carried under the caption of "Current Assets" an item of $3,283,085.20, designated "Special Deposits."

When question was raised in the spring of 1933 with reference to the contracts between the railroad company and Terminal Shares, Inc., he said, and it appeared that the item designated "Special Deposits" was in part a cash payment on the purchase of the Terminal Shares, the R.F.C. asked the federal court in St. Louis, in which the road had filed a petition in bankruptcy, to appoint a trustee or trustees to investigate among other things the contracts for the purchase of the Terminal Shares. When the court appointed trustees it, at the request of the counsel for the railroad company, referred the matter to a special master. The master filed his report in February, 1935, sustaining the contracts.

The R.F.C. filed exceptions to the report and asked that it be set aside and that the trustee be directed to sue to recover the money paid. The court on December 2, 1935, granted the motion of the R.F.C. and set aside the master's report and directed the trustee to sue to recover the money paid. Meanwhile, on October 5, 1935, the R.F.C. referred to the Attorney General the question of whether or not failure to disclose the contracts and the accounting thereunder in the loan application constituted a violation of Section 16a of the R.F.C. act.

He added that "we regard the loans as fully secured."

Joseph B. Keenan, Assistant Attorney General, had replied on October 24 that it appeared from the dates set out "that action would be barred by the three-year statute of limitations, inasmuch as the offense was consummated at the time the applications containing the false statements were filed."

Barriger Testifies on R. F. C. Dealings

J. W. Barriger, III, chief examiner of the railroad division of the R.F.C., testified that the liability under the contracts should have been listed as among "deferred liabilities" and that the forecasts of earnings submitted by the Missouri Pacific in connection with its application failed to earmark the payments on the Terminal Shares contracts. While he was on the stand Senator Wheeler put into the record a memorandum addressed to the R.F.C. board by Mr. Barriger on April 25, 1935, saying the application had been based upon "false balance sheets," and that had disclosures regarding the contracts been made "the Terminal Shares contracts would have been the subject of investigation and their unfairness would then have been revealed. The consequence would doubtless have been that the application for the loan would have been rejected in the absence of a cancellation or substantial modification of the Terminal Shares contracts."

There was also produced an extract from a letter dated June 14, 1935, from Alexander Wylie, director of the Bureau of Accounts of the Interstate Commerce Commission, to John Howland, attorney for the railroad division of the Reconstruction Finance Corporation, saying: "Under the assumption that this was a valid contract without the approval of the commission a proper statement of the accounts of the carrier would require

that the full liability under the contract should be included in account 770, 'Other deferred liabilities,' and as the payments became due under this contract the amount thus payable should have been transferred under current liabilities to account 761, 'Miscellaneous accounts payable.' The contra entry to the amount initially recorded in account 770 should have been included in account 722, 'Other deferred assets.'"

Senator Wheeler also produced copies of letters signed by L. W. Baldwin, president, and T. M. Niven, general auditor of the Missouri Pacific, replying to inquiries made by Oliver E. Sweet, director of the Bureau of Finance of the I.C.C., and M. O. Lorenz, director of the Bureau of Statistics, regarding reports that the company had acquired control of three terminal railroads without having filed applications to the commission. Other letters showed that before the replies were sent they had been referred to various counsel and to William Wyer, secretary-treasurer; Herbert Fitzpatrick, vice-president, and O. P. Van Sweringen, chairman, and had been checked and redrafted. Mr. Baldwin then replied briefly to Mr. Sweet saying that:

"Contracts have been entered into between this company and the owners of the stock of such corporations whereby this company may, upon certain terms and conditions, within a period of five years from date of such contract purchase all of the stock of the Union Terminal Railway Company and St. Joseph Belt Railway Company subject to the approval of the Commission; and may also acquire two-thirds of the capital stock of the North Kansas City Development Company, owner of certain industrial properties located at North Kansas City, Missouri."

Mr. Wyer testified that he had not seen the letter at the time it was sent but in reply to Senator Wheeler as to whether he thought it was "a full disclosure to the Interstate Commerce Commission of the facts in the case," he said he did not.

Because Mr. Wyer had testified that the Chesapeake & Ohio had accounted similarly for a similar transaction, J. J. Anzalone, comptroller of the Alleghany Corporation, was questioned about C. & O. contracts to purchase Erie and Nickel Plate stock from the Alleghany and Senator Wheeler brought out that the commission's Bureau of Accounts had later required that the accounting for the payments be changed.

Replying to Mr. Barriger's testimony, Mr. Wyer referred to a memorandum written by him taking the position that the Missouri Pacific loans were sound but Senator Wheeler said this was written on the basis of the balance sheet as reported. He asked Mr. Wyer if Mr. Barriger had not said to him after the hearing that the Missouri Pacific's bookkeeping was "crooked." Mr. Wyer replied that he had and that he was very much surprised.

On December 18 Senator Wheeler questioned Arthur M. Anderson and George Whitney, of J. P. Morgan & Co., regarding details of the financing of various Van Sweringen companies and the first loan made to the Missouri Pacific in 1932 by the Reconstruction Finance Corporation, a large part of which was to pay off bank loans and which the Interstate Commerce Commission had approved "with some reluctance." Mr. Whitney said his firm would have refused to advance additional funds to the railroad unless there were assurances that it would receive assistance from the R.F.C., and had called loans so that it could apply to the R.F.C. It was brought out that the Morgan firm had knowledge of the Terminal Shares contracts and that in its own analysis of the Missouri Pacific situation had not treated the payments made on the contracts as assets.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended December 12, totaled 738,747 cars, a decrease of 6,210 cars as compared with the loading for the week before but an increase of 122,097 cars, or 19.8 per cent, as compared with the corresponding week of last year. This was also an increase of 24,882 cars, or 3.5 per cent, as compared with the corresponding week of 1930. All commodity classifications showed increases over the corresponding figures for last year and coal and forest products showed increases over the week before. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loading

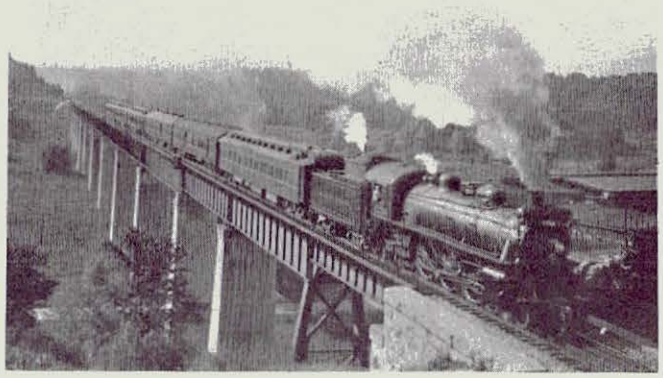
Districts	1936	1935	1934
Eastern	164,644	139,342	133,393
Allegheny	148,982	121,791	111,250
Pocahontas	53,821	43,335	40,615
Southern	110,005	90,316	88,066
Northwestern	85,066	72,638	68,411
Central Western	114,536	96,146	87,683
Southwestern	61,893	53,082	50,784
Total Western Districts	261,795	231,866	206,878
Total All Roads	738,747	616,650	580,202
Commodities			
Grain and Grain Products	35,863	29,236	30,373
Live Stock	16,778	14,114	18,341
Coal	170,664	132,180	148,903
Coke	11,315	8,056	7,267
Forest Products	34,285	27,496	20,790
Ore	8,158	7,551	3,089
Merchandise L.C.L.	166,618	156,245	154,401
Miscellaneous	295,066	241,772	197,038
December 12	738,747	616,650	580,202
December 5	744,957	638,518	551,485
November 28	679,984	571,878	488,185
November 21	780,500	647,924	561,942
November 14	784,672	629,738	585,034
Cumulative Total, 50 Weeks	34,771,393	30,436,780	29,872,078

Car Loading in Canada

Car loadings in Canada for the week ended December 12 totaled 49,710, or 6,779 above last year, and 337 cars below the previous week's total, according to the compilation of the Dominion Bureau of Statistics

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
December 12, 1936	49,710	29,605
December 5, 1936	50,047	27,612
November 28, 1936	49,586	25,751
December 14, 1935	42,931	24,173
Cumulative Totals for Canada:		
December 12, 1936	2,393,969	1,183,613
December 14, 1935	2,279,497	1,070,446
December 15, 1934	2,249,602	1,063,050

* * *



On the Canadian Pacific Near Toronto, Ont.

Emergency Rates Die With Old Year

I. C. C. denies railroad petition for continuance pending consideration of new proposals — Mahaffie and McManamy dissent

WASHINGTON, D. C.

THE source of most of the net income earned by the railroads this year above the amount of their fixed charges was knocked out, so far as the immediate future is concerned, by a decision of the Interstate Commerce Commission on December 18 (made public on December 19) denying the petition of the Class I roads for a continuance of the present emergency charges, which since April 18, 1935, have been superimposed on a large part of the basic freight rates of the rail and water carriers subject to the commission's jurisdiction, pending consideration by the commission of proposals made by the carriers for a readjustment of rates, including increases intended to offset to some extent the loss of the revenue from the so-called "surcharges."

Have Been Producing $10,000,000 a Month

The emergency charges have been producing revenue at the rate of approximately $10,000,000 a month and for the first ten months of 1936 have amounted to $99,521,000 according to the railroad estimate, whereas the net income for the period was estimated at $88,793,814, and it was asserted that many important railroads would have incurred deficits without the emergency charges. They were authorized by the commission in Ex Parte No. 115 as a substitute for certain increases proposed by the railroads for a period to terminate on June 30, 1936, but on petition of the roads this was extended until December 31 and a number of modifications were made.

Pointing out that the net railway operating income of the roads for the first ten months of 1936 was $636,148,283, nearly 28 per cent greater than that earned in the first ten months of 1935 and greater than the total for any entire calendar year since 1930 the commission says:

Commission Finds Emergency Has Passed

"The unmistakable conclusion from these figures is that the emergency which we undertook to meet in our original decision in March, 1935, does not now exist. A continuing revival of industry appears likely to result in a further increase in traffic, and no sharp general increase in operating expenses is immediately in prospect. Shippers and receivers of freight have every reason to expect the elimination of the emergency charges at the end of this year, and an extension in the light of our previous expressions under existing conditions they express the opinion would amount almost to a breach of faith."

The commission is prepared, however, it said, to give the promptest possible consideration to the new plan submitted by the railroads, on which hearings are to begin on January 6.

Chairman Mahaffie and Commissioner McManamy dissented, taking the position that "the present emergency charges have not hurt business" but "they are helping the carriers," and that "it is far more important for them to continue aggressively their program for maintenance and improvement of their properties so that they may be in condition to render service during the winter than it is to suspend the emergency charges."

Following are excerpts from the majority and the dissenting opinions:

I.C.C. Majority Report

Many important railroads, it is asserted, would have incurred deficits without the emergency charges. In the case of others, which failed to earn their fixed charges, the deficits would have been considerably greater without the revenue attributed to the emergency charges. In the first 10 months of 1936 the rate of return on recorded property investment (without deduction for depreciation) for the railroads as a whole was 2.36 per cent. The estimated rate of return without the emergency charges is 1.92 per cent.

It is stated that the revenue from the emergency charges has enabled certain carriers to discharge their indebtedness to the federal government and otherwise maintain their credit. This revenue is also considered necessary by the carriers to permit them to increase their expenditures for maintenance, which during the depression were drastically curtailed. Much larger sums have been spent for maintenance in 1936 than in 1935, and purchases of cars, locomotives, and rails have also increased to an important extent. The carriers voice the fear that, unless the emergency charges continue in 1937, their program for improvement of their facilities may have to be abandoned or revised. They also suggest that another alternative might be a reduction in railway employment, which in November, 1936, was greater than that in corresponding month of 1935 by about 100,000 men.

The carriers stress the rising trend in their taxes. Railway tax accruals in the first 10 months of 1936 were $259,959,157, compared with $204,000,000 in the corresponding period of 1935. The increase is said to be due in part to higher income taxes, as well as social security taxes and reserves for the railway pension tax. If the latter tax is held valid, the cost to the carriers will be $58,000,000 per annum. The railroads' share of taxes assessed under the unemployment provisions of the Social Security Act will be $35,000,000 in 1937. Despite these increases the accruals for the first 10 months of 1936 were lower than those for the same period in 1930 by $43,267,709, apparently reflecting the fact that in the intervening period there have been important reductions in general property taxes levied against the railroads.

Continuance of the emergency charges is opposed by the National Association of Railroad and Utilities Commissioners on behalf of its constituent State regulatory commissions, certain individual state commissions, the National Bituminous Coal Commission, the Consumers' Counsel, the National Industrial Traffic League, the Southern Traffic League, and numerous commercial organizations, as well as individual shippers. For the most part opponents of the petition reiterate contentions advanced against the original establishment and subsequent continuance of the emergency charges. It definitely appears, however, that resistance to the emergency charges is more pronounced and widespread than it was at the time of either their original establishment or later extension. There are many shippers who have felt that the resulting transportation charges were unreasonably high as well as prejudicial because of the varying application of the emergency charges but have nevertheless maintained a passive attitude because of the transitory character of the charges. In the case of some shippers this attitude also was due in part to sympathy with the carriers' financial plight during the earlier stages of the period of recovery. At present, however, shippers appear to be substantially unanimous in the view that, whatever the original justification for the emergency charges may have been, the emergency

which they were designed to meet has passed or is rapidly passing, and that further continuance pending disposition of the carriers' proposal to make changes of a permanent nature in their rate structure is both unjustified as an emergency matter, and would distinctly increase the diversion of traffic from the rails.

The emergency charge was unknown in rate terminology prior to our decision in the *Fifteen Per Cent Case*, 1931, 178 I. C. C. 539. As a form of rate it may be regarded as a phenomenon of the economic depression, having been devised as an expeditious means of increasing freight rates temporarily under circumstances deemed not to warrant or require permanent increases. In the case last cited the authorization of emergency charges was linked with a plan for pooling and redistributing the proceeds in aid of the weaker railroad companies.

We have fully recognized a number of valid objections to the emergency charges which are accentuated by long duration, which have been commented upon in our prior reports in this proceeding, and need not be repeated. They produce tariff complications and make it difficult to ascertain applicable rates. In numerous instances the emergency charges have either been eliminated or the base rates have been so reduced that the total charge is less than before the imposition of the charges. That many of these reductions were necessary and proper is beyond question, but others apparently serve little or no purpose other than to give one carrier or group of carriers a temporary advantage over others in the solocitation of traffic. Such reductions make for undue prejudice. In other cases competing commodities are differently treated.

Although freight traffic has been on the increase throughout the current year, the principal expansion has taken place in the latter months since our second report in this proceeding. In the final quarter, up to the present time, the carloadings have been consistently higher than they were for the corresponding period of 1931, and in certain weeks have approached or surpassed those in 1930. The cumulative loadings for the first 49 weeks of 1936 are 16 per cent higher than those in the same period of 1934, when this case was in its first stage, and but 4.5 per cent lower than those for the same portion of 1931. This increase in traffic is reflected in improved earnings, both gross and net.

As before pointed out, the carriers and those supporting their petition urge that their margin of net revenue is so slender that it should not be reduced to the extent of $10,000,000 per month. We are not convinced that so great a loss of revenue will follow. It is difficult to calculate accurately the real amount yielded by these charges and estimates obviously have in them many elements of uncertainty. Furthermore, it is unquestionable that in certain cases the charges have had a restrictive effect on rail traffic, and it is to be expected that their removal may result in some increase in traffic. While the immediate result of our refusal to authorize a continuance of the emergency charges will put in effect rates lower than those now in effect, we are not called on to find that all existing basic rates will be maximum reasonable rates in the light of present conditions. On the other hand, we can not find on the present state of the record that the existing basic rates, plus the emergency charges already authorized for a temporary period, will be just and reasonable as maximum rates on and after January 1, 1937.

Five years ago in *Fifteen Per Cent Case, 1931, supra*, we stated our belief that a considerable number of rates could reasonably be advanced substantially. The same opinion was stated somewhat differently at page 63 of our original report: "In this process of gradual change, it is equally desirable to subject the rate structure to the most detailed analysis, for the purpose of discovering where it now repels or impedes traffic, where reductions can be made which will by their effect on traffic increase aggregate revenues, and where increases are possible which industry and traffic can bear without harm."

The only evidence of compliance with this suggestion in the period of 18 months after it was made is to be found in the two proposals by the carriers to apply the emergency charges indefinitely when the first extension was sought and later in July of this year. As before pointed out, the plan proposed in the petition of October 23, 1936, is somewhat different. We are prepared to give the promptest possible consideration to that plan. We believe that such consideration will be simplified and expedited if the emergency charges are definitely out of the way. It should be unnecessary to add, as we do for the sake of caution, that our present conclusions are wholly without prejudice to such determination of the lawfulness of individual rates or groups of rates as may be warranted by the record to be made at further hearings of such issues in this proceeding.

It is of the utmost importance also to bear in mind that rate adjustments are only one of the possible means of bringing about enhancement of net revenue. In the interest of brevity we omit quotation of extended statements in our prior reports concerning the necessity for elimination of competitive waste and a greater degree of co-operation between carriers.

Dissenting Opinions

MAHAFFIE, *Chairman*, dissenting:

As the majority state, traffic and earnings are showing improvement. That improvement has not yet gone far enough to permit the railroads to restore the deferred maintenance incurred during the depression period, nor to enable them to acquire the new equipment and facilities necessary to handle safely and promptly any considerable additional traffic. Prompt and efficient railroad service is essential to the commercial welfare of the country. To insure it the carriers must have earnings sufficient not only adequately to maintain their properties, but to furnish a basis for credit. The possession of credit enables facilities to be acquired not only to meet the needs of shippers more adequately, but in ultimate effect, by reducing costs, makes possible the legitimate lowering of rates. Credit is dependent on earnings and the prospect of earnings. Prospects of further improvement are, at present, excellent, but they will not be helped by the action of the majority in this proceeding. The 2.36 per cent now being earned on property investment is a low return. It is not sufficient to make possible the rehabilitation and improvement of the railway plant that is required to meet the demands of commerce. Efficient railroad service is more important to the shippers and to the country as a whole than is the exact level of railroad rates. In the long run that character of service can be furnished only by carriers operating at a profit.

The present emergency charges have not hurt business. They are helping the carriers. We are asked to permit them to be continued until we can consider and act on the revised basic rate structure recently proposed. Subject to the limitation that resulting rates may not exceed the rates proposed for permanent application, the application should be granted.

MCMANAMY, *Commissioner*, dissenting:

The majority here affirms the conclusion reached in its supplemental report of June 9, 1936, 215 I.C.C. 439, which in effect was that the emergency then found to exist would disappear on December 31, 1936, and that the emergency rates authorized in that proceeding must expire on that date. In view of the fact that conditions which might exist on December 31, 1936, could not be known on June 9, 1936, therefore could not appear in the record in the case, fixing at that time a date upon which the emergency charges should cease could only be a prediction or the expression of a hope which, in my opinion, was not then justified and has not since been realized.

The records show that more than 28 per cent of the total railroad mileage in the United States is now in the hands of trustees or receivers. It is also shown that during the first eight months of 1936 almost one-half of the total class I railroad mileage in the United States failed to earn fixed charges even by including the emergency charges, and that without the emergency charges class I railroads would have failed by more than $60,000,000 to earn their fixed charges during the first eight months of 1936.

The carriers state that without the emergency charges their programs for maintenance of equipment and improvement of their facilities will have to be abandoned or revised. There is too much support in our records for these statements to permit them to be lightly brushed aside. It has been many years since the country has been as close to a car shortage as it is at present and, due to deferred maintenance during the years of depression, the railroads will go into the winter with an inadequate supply of both locomotives and cars in good condition. Under such conditions the result of a period of severe winter weather will be disastrous and will cost the business interests of the country many times the amount of the emergency charges which so far have not been shown to have injured anyone.

The question of safety will also be adversely affected by a re-

duction in carriers' revenues. It has been well known throughout this entire proceeding that during the depression maintenance expenditures were cut to the bone and the results are now becoming apparent in our accident records. Our records show that during the nine months ended with September, 1935, there were 4,704 train accidents, while during the corresponding months of 1936 there were 6,099. They further show that during the nine months ended with September, 1935, 397 employees on duty were killed and 11,885 were injured, while during the corresponding months of 1936, 473 employees were killed and 16,002 injured, and this record is sure to increase during the winter when both maintenance and operation are more difficult. These increases cannot be accounted for by increases in the number of employees because our record for October, 1936, shows a decrease of 1.57 per cent in the total number of employees as compared with November, 1935. For all classes of persons the records show that during the nine months ended with September, 1935, 3,796 were killed and 20,408 were injured, while during those months of 1936, 3,882 were killed and 25,306 were injured.

Along with industry in general, the railroads are emerging from the effect of the worst depression in their history. To my mind it is far more important for them to continue aggressively their program for maintenance and improvement of their properties so that they may be in condition to render service during the winter than it is to suspend the emergency charges. Instead of taking any action which will in any way reduce expenditures for maintenance of way and equipment, carriers should be encouraged and, if possible, required to increase them.

For reasons above given, it is my view that the emergency charges should be continued during the consideration by the Commission of this proceeding which at the best will require at least six months and probably a year or more. Decreasing carriers' revenues pending consideration of this matter will, in my opinion, have a far more serious effect on industry in general and on the railroads in particular than the continuation during the period of adjustment of the emergency charges now in effect. I therefore disagree with the conclusions here reached by the majority.

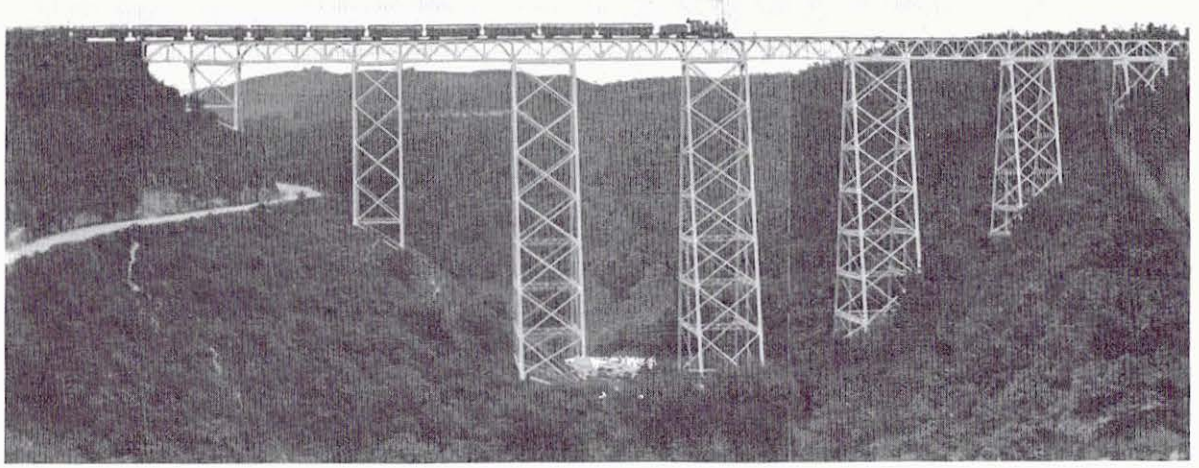
Efficiently-Operated Central American Line

International Railways handle a large business smoothly and safely in mountainous countries

THE International Railways of Central America operates 795 miles of main line and branches in the Central American republics of Guatemala and El Salvador.

The Guatemala main line from Ayutla, on the Mexican border, generally parallels the Pacific coastal plain for a distance of 130 miles to Escuintla, where it abruptly turns inland and crosses the continental divide, at an elevation of 5,000 ft., to Puerto Barrios on the Atlantic seaboard. Branch lines reach to the two Pacific Coast ports of Champerico and San Jose, both of which are open roadsteads where freight and passengers are handled in lighters. Other branch lines run from Mulua to San Felipe, and from Palo Gordo to San Antonio, tapping coffee producing territory, and acting as gateways to and from the highlands in the interior of the republic.

At Zacapa, in Guatemala, 95 miles east of Guatemala City, the connection to El Salvador is made, extending into El Salvador and through the entire length of that republic to the Pacific port of Cutuco on the Gulf of Fonseca, where the railway maintains up-to-date warehouse facilities and a wharf that permits deep draft vessels to come alongside. A branch line from Texis Junc-



Banana Train Crossing Las Vacas Viaduct Just Outside Guatemala City. This Viaduct is 744 Ft. Long and 244 Ft. Above the Level of the Stream

tion, 62 miles west of San Salvador, running to Ahuachapan, a distance of 37 miles, serves a highly cultivated farming area. The main money crop here, as well as in other parts of El Salvador, is coffee.

Banana Handling

The Pacific division, traversing an intensively cultivated territory, originates a large proportion of the railway's export freight tonnage in Guatemala, composed primarily of coffee and bananas. Of particular interest is the successful handling of bananas, a highly perishable commodity, for a distance of as much as 331 miles, from point of loading to Puerto Barrios, the railway's modern port and wharf on the Atlantic. To accomplish this, close supervision must necessarily be given to every detail of operation to avoid delay from any cause. In advance of the loading date, specially designed ventilated cars, bedded with banana leaves to prevent bruising of fruit, are spotted at the different loading stations, and in readiness when the bananas arrive from the farms. Power and crews are assembled. Hour-to-hour reports on progress of loading come to a central point. Trains are ordered accordingly and start the long trip across the backbone of the Rockies to the tropical lowlands of the Atlantic seaboard, at Puerto Barrios, where the cars are switched onto the railway docks, and the bananas then transferred from cars into steamers.

During the trip, this fruit is raised from sea level to 5,000 ft. entering Guatemala City, negotiating grades as heavy as 3.6 per cent. In the heavy grade territory between Escuintla and Palin, a distance of 16 miles, two, three and even four engines are placed in a train. In other districts where grades are lighter two engines are ordinarily used.

From Guatemala City, after having crossed the continental divide, there are heavy descending grades, but before reaching Puerto Barrios, three secondary summits must be crossed, necessitating two engines in each train and, over short stretches, a third engine is added.

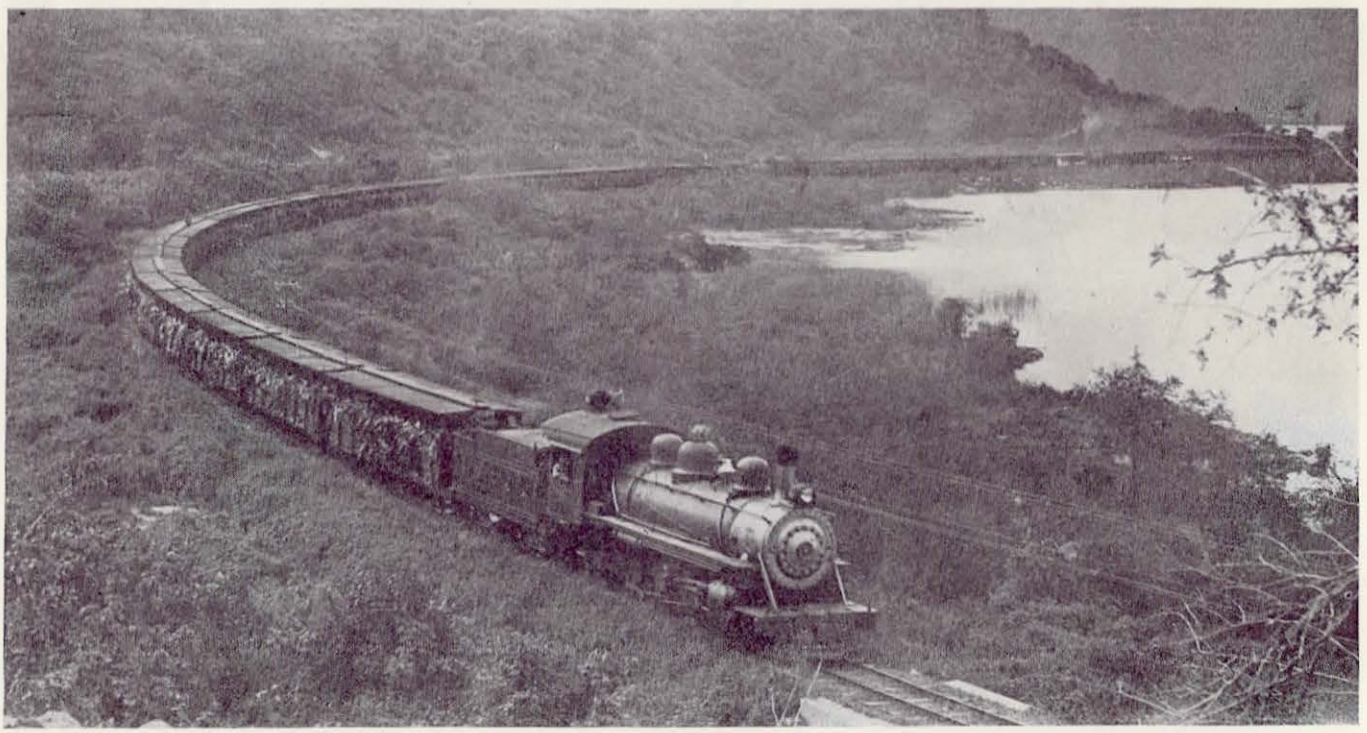
The banana producing district on the Atlantic division presents no such transportation problem, since this district does not involve long hauls or heavy grades.

Rough Country Traversed

The mountainous character of the country through which the railway passes, together with torrential tropical rains at certain times of the year, increases the operating problems. Interruptions to traffic, however, are minimized. In the rainy season, emergency gangs and work machinery, especially steam ditchers, are assembled at strategic points and are constantly available for emergency service. Regular passenger and freight service is maintained between all points on the railway at all seasons.

In addition to the heavy banana and coffee tonnage, the local freight traffic is important. It consists largely of foodstuffs. Imports of manufactured articles from the United States and Europe are also heavy. Freight ton miles are divided 49 per cent export, 25 per cent import and 26 per cent local freight. Between five and six million bunches of bananas, and about one million 150-lb. bags of coffee are exported annually over this railway.

First and second class passenger service is provided, with special chair car service on certain trains. The passenger travel is divided 15 per cent first class and 85 per cent second class.



Train Containing 14,500 Bunches of Bananas on the Shores of Lake Amatitlan in Guatemala

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THE INTERSTATE COMMERCE COMMISSION on December 17 filed a decision in the federal court at St. Louis, denying the application of counsel for trustees of the St. Louis, Iron Mountain & Southern, for more than the $25,000 fees allowed them previously. Counsel for the trustees sought $75,000 compensation. The fees were sought in connection with services rendered in the so-called "gold clause" case, in which holders of $35,548,000 of Iron Mountain bonds sought, in the Missouri Pacific railroad reorganization proceedings, to be paid in gold, or its equivalent in currency when the bonds matured.

Labor Conditions in Intercity Motor Transport

Former Co-ordinator Eastman reports on state regulations and company practices

WASHINGTON, D. C.

JOSEPH B. EASTMAN, former federal co-ordinator of transportation, has this week issued the third part of a series of reports on hours, wages, and working conditions in the intercity motor transport industries. Parts I and II of the report, previously issued dealt with conditions in the bus and truck industries respectively. The report was prepared by the Section of Research and the Section of Labor Relations of the co-ordinator's organization. Part III is supplementary to the other reports and covers four major subjects: (1) State regulation of the hours of service of motor transportation employees; (2) state regulations and company practices with respect to the selection or qualification of drivers: (3) accidents, and the factor of driver fatigue; and (4) aspects of labor relations in bus and truck transportation.

State Regulation of Hours of Service

Forty-three states and the District of Columbia have regulatory measures which apply to the hours of service of drivers in the employ of one or more classes of motor carrier. Louisiana, Maryland, Pennsylvania, Vermont and West Virginia are the exception. The regulations of many states specifically apply to owner-drivers and those of other states are so worded as to comprehend this group of drivers. Drivers of vehicles engaged in strictly intracity or suburban operations, of farm-owned trucks or trucks engaged in the transportation of farm products, and of certain other special classes of vehicles frequently are not subject to hours-of-service requirements. Practically all of the statutes or administrative regulations deal with daily hours and embody three basic principals: (1) prohibition of continuous service in excess of a specified maximum number of hours; (2) prohibition of aggregate or non-continuous service in excess of a specified maximum number of hours within a specified period; and (3) requirement of a minimum number of hours of rest. Exceptions are usually made for certain emergency conditions.

Typically, the laws or rules set limits on continuous service by providing that it shall be unlawful for any carrier subject to the law or rule to require or permit any driver to remain on duty or to drive longer than specified number of hours, ranging from 7 to 14 but most frequently 12 or 10. Twelve is the longest period specified for bus drivers and 14 for truck drivers. Of the 29 states which have limited the consecutive hours of drivers of common-carrier busses, 14 specify a 12-hour maximum, 8, a 10-hour, 6, an 8-hour, and 1, a 7-hour. The hours of drivers of contract-carrier busses are limited in about the same proportions in 25 states. Of the 33 states which set limits on the hours of drivers of common-carrier trucks, 17 apply a 12-hour maximum, 8, a 10-hour, 5, an 8-hour, 1, a 7-hour, and 2, a 14-hour. The distribution is substantially the same in the case of the 31 states which limit the hours of drivers of contract-carrier trucks. Fourteen states limit drivers of private trucks, 7 applying a 12-hour maximum, 4, a 10-hour, 1, an 8-hour, and 2, a 14-hour.

These limitations on continuous service are usually followed by a prohibition which makes it unlawful for a carrier to require or permit a driver to remain on duty more than a designated number of hours in the aggregate. The most common limits on aggregate hours are 10, 12, 14 and 16 in 24, with a range down to 8 hours in 24. Limitations of this kind are set for drivers of common-carrier busses in 39 states, of contract-carrier busses in 32 states, of common-carrier trucks in 41 states, of contract-carrier trucks in 37 states, and of private trucks in 17 states. Limitations on aggregate hours serve to protect drivers against having to work through two or more periods of consecutive service separated by a technically lawful but inadequate period of rest, and to reduce hours in the interest of safety, while permitting them to be spread over a period long enough to minimize interference with the carriers' operating requirements.

The laws and rules typically follow up the limitation of hours of service with a requirement respecting consecutive hours of rest. Usually the number is 8, but the range is as high as 12. The 8-hour requirement is most frequently coupled with 10 or 12 consecutive hours of service and with 10 or 12 (in 24) hours of aggregate service, and 10 hours' rest more often is imposed in connection with 10 or 12 consecutive hours of duty or 14 or 16 (in 24) hours in the aggregate. Of 24 states prescribing rest after continuous service, for drivers of common-carrier busses, 15 prescribe 8 hours, 5 prescribe 10, and 2 prescribe 12; of 29 states prescribing a rest period after aggregate service, 16 prescribe 8 hours and 9 prescribe 10. Coupled with limitations on continuous service of drivers of common-carrier trucks, 20 states require 8 hours and 5 require 10 hours of rest; coupled with limitations on aggregate hours of service, 18 of 32 states require 8 and 12 prescribe 10 hours. The requirements for drivers of contract-carrier busses and trucks are quite similar. The off-duty period of drivers of private trucks is limited in only 14 states, 9 of which require 8 hours' rest after continuous service; after aggregate hours of service, 8 require 8 hours and 5 require 10.

Because the principal objective in hours-of-service regulation is protection of the traveling and shipping public and of drivers through prevention of accidents caused by exhaustion from over-long duty, a majority of the states make no distinction between the kinds of work at which the driver has been occupied. Thus, some laws expressly apply to service rendered "in any capacity." In a number of states, however, driving hours alone are limited. Truck drivers, especially, put in a considerable number of hours on duty beyond their driving hours.

The chapter also discusses state regulation of inter-

state operations; factors involved in protecting the limitation on period of service and the interpretations given such factors by the courts in construing the railroad hours of service act; various provisions for relaxation of regulations under emergency conditions; and general problems of enforcement.

Qualifications of Bus and Truck-Drivers

Some minimum qualification standards for bus and truck drivers have been established by most of the states. Such standards vary widely, however, and in some states are no higher than those which apply to any driver of a motor vehicle. Some states set higher qualification standards for drivers of busses and for-hire trucks than those expected of drivers of trucks used in private operations, and some modify their requirements so that owner-operators do not have to meet the standards set for employed drivers. Although many bus and truck companies have adopted employment standards which in some respects test drivers' qualifications, the only factor generally adopted by both states and companies is an age requirement.

Only two states do not have a minimum age requirement for either bus or truck drivers, although in three-fourths of them this requirement can be met by an unchecked declaration of the applicant. Disregarding the effects of laws in 19 states which permit licensing of younger persons with the endorsement, signature, or consent of parent or guardian, 29 states (including the District of Columbia) require bus drivers to have reached 21 years of age and 7 states specifically set the standard at 18 years. The 11 remaining states merely prescribe a minimum applicable to all drivers of motor vehicles. Seventeen states require the drivers of some or all classes of for-hire trucks to have reached 21 years of age; 1 sets a 19-year minimum, 15 an 18-year, 2 a 16-year, and 1 a 15-year minimum.

All of the bus companies and 98 per cent of the truck companies covered in the 1933 field study and 87 (90 per cent) of the 96 bus companies and 157 (65 per cent) of the 240 truck companies surveyed in the 1935 studies had adopted minimum age requirements. The latter groups of companies employed, respectively, 81.2 per cent and 58.4 per cent of all the bus and truck drivers surveyed. The changes in the proportion of companies reporting a minimum age requirement may be attributed to the strengthening of state requirements in the interval or to differences in the companies covered in the two years.

In 1935, 20 years was the lowest minimum age reported by bus operators and 18 years by truck operators, while 27 years was the highest minimum age reported by either group. The most frequent minimum was 21 years for truck drivers and 24 or 25 years for bus drivers, with 21 years the next most common minimum for bus drivers and 25 years for truck drivers. The operators surveyed observed, on the whole, higher standards than those set as minima by the states.

Maximum ages above which applicants for employment as drivers would not be considered were reported by all except 10 per cent of the bus and 14 per cent of the truck companies included in the 1933 field study.[1] The most common maximum was 35 years and under 40 years of age. A very small percentage reported that they employed no new drivers who had reached 30 years of age; about 15 per cent of the surveyed bus operators and 9 per cent of the truck operators reported they would not engage drivers who had reached 35 years of age; an age limit of 40 years or less was set by 48 per cent of the bus and 37 per cent of the trucking companies; and an age of 45 years or less, by 67 per cent of the bus and 58 per cent of the truck companies. However, nearly 18 per cent of the bus companies and 21 per cent of the truck companies reported a maximum hiring age of 45 and under 50 years. An age of 50 years would bar engagement as a driver in the case of all except 5 per cent of the bus and 6 per cent of truck companies surveyed. Among the companies included in the 1935 survey, the 35-year limit was most common. Very few bus operators then reported that they would hire regular intercity drivers who had passed the 40-year mark and none expressed a willingness to hire a driver who had passed his 45th birthday. However, employers of almost a fourth of all truck drivers surveyed in 1935 reported that they would not bar applicants between 40 and 50 years of age, though only a few recognized 50 years as a working standard. It is not known how rigidly the carriers adhere to the standards which they reported. It may be noted, in this connection, that almost 98 per cent of the bus drivers and over 96 per cent of the truck drivers and helpers employed by companies embraced in the 1933 field study were between 21 and 45 years of age.

About two-thirds of the states which license bus and truck drivers require an examination of the applicant. The principal qualification commonly sought in such examinations is the applicants' knowledge of the states' motor-vehicle regulations. Other features of such examinations which are often required, but which vary somewhat with the type of vehicle to be driven, include ability to drive (a part of the test in 24 to 25 states), a vision test (used in 20 to 26 states), a hearing test (used for bus drivers in 9 states and for for-hire truck drivers in 8 states), and a physical examination (required of these drivers by 3 states and optional with the examiners in 6 states). At least eight states require applicants for licenses to drive for-hire vehicles to be experienced the requirement ranging from no specified amount in one state to periods of 6 months to 2 years in the others.

While many bus and truck operators depend on the state requirements as a guarantee that applicants are qualified, 68 of the 96 bus and 187 of the 240 truck operators covered in the 1935 surveys reported that they would hire only experienced drivers. The experience required ranged from 6 months to 5 years, but generally was 2 years or 1 year. Almost 94 per cent of the bus drivers and slightly more than 89 percent of the truck drivers surveyed in the 1933 field study were found to have had 3 or more years of experience in driving busses or trucks.

The report also develops information with respect to the requirement of mechanical skill, of driving tests and company training, of references and recommendations, and of physical examinations. The report also describes the use of special incentives to efficient and safe operation, as well as miscellaneous requirements, such as height, weight and schooling.

The various surveys reveal that, generally, given qualifications are more extensively required in bus than in the truck operations, and proportionately more widely among companies included in the railroad bus and truck reports than among those included in the field surveys.

Motor Vehicle Accidents

Statistics relating to motor vehicle accidents are far from satisfactory, particularly with respect to establishing causes. Improvement is occurring, however.

Drawing on published sources, the report traces the growth in deaths attributable to motor vehicles from

[1] In 1935, companies employing 74 per cent of the surveyed bus drivers and 51 per cent of the surveyed truck drivers reported a maximum hiring age.

about 28,000 in 1928 to 37,000 in 1935. In the earlier year, 59 per cent, and in the latter, 68 per cent, of these accidents occurred in rural districts. Deaths charged to motor vehicles increased 25 per cent from 1932 to 1935, whereas population increased only 1.9 per cent. motor-vehicle registrations, 8.7 per cent, and estimated gasoline consumption, 14 per cent. Trends in the relative number of passenger cars, trucks and busses involved in these accidents are traced in the report, but caution is shown to be necessary in drawing conclusions as the data do not measure the responsibility for accidents.

Evidence indicative of the beneficial effects which have followed the adoption by the states of improved drivers' license laws and administration methods is given, and steps taken by employers to reduce driver-fault accidents are described.

Variation in the limitations imposed by employers and in those established by the states discloses a substantial lack of agreement as to the number of hours which constitute safe limits of road service and of total work for drivers. Interfering with closer agreement is a lack of knowledge of the governing facts, principal among which is the number of hours which drivers can work without becoming over-fatigued. Certain laboratory and field work leading to the establishment of practicable methods of measuring fatigue is described, as are the instruments developed for this purpose.

Labor Relations

The concluding chapter, Labor Relations in the Intercity Motor Transport Industries, attempts first to indicate the extent and character of organization among employees of motor carriers. It points out that, while such employees are not extensively or uniformly organized in labor unions in the sense that railroad employees are, headway has been made by four national organizations: the Amalgamated Association of Street and Electric Railway and Motor Coach Employees (hereinafter referred to as the Amalgamated), the International Brotherhood of Teamsters, Chauffeurs, Stablemen, and Helpers (Teamsters' Union), the Brotherhood of Railroad Trainmen (Trainmen), and the International Association of Machinists (Machinists). All except the Trainmen are affiliated with the American Federation of Labor. Jurisdictional agreements govern these unions in their organizing activities.

Of 223 trucking operators from whom usable returns were received in the October, 1935, field survey, 62 reported the existence of some arrangement for collective bargaining; of 21 companies in which the railroads had a 25 per cent or greater voting power, 6 reported such arrangements. While not indicative of the proportion of employees organized or covered by arrangements for collective bargaining, the fact is noted that, in the case of both groups, about 45 per cent of the surveyed labor force was in the employ of companies which recognized collective bargaining. Returns were had, however, from companies of larger than average size. Relatively greater progress in unionization has been made among employees of trucking operators having substantial numbers of local drivers. A number of agreements have been signed in recent months. In October, 1936, the Teamsters' Union had 313 locals with intercity drivers in their membership and a total membership, including helpers, platform and garage men (other than mechanics), of between two and three hundred thousand. Data as to the number of such members who are engaged in intercity operations are not available. There are other locals whose membership includes drivers engaged in intercity or farm-to-market operations. Organization has been extended to small operators and owner-operators have become members of locals on a special basis. In some instances agreements are entered into with a local, a state, or a regional association of operators. Organization has tended to follow the lines of territorial or trade areas. Large cities are strategic points in organization efforts. Relatively little organization has occurred in the South or Southwest.

Of 76 independent intercity bus operators furnishing usable returns in the October, 1935, survey, 5 reported the existence of some arrangement for collective bargaining with standard unions. These companies employed 16 per cent of the drivers covered in the survey. Five of the 20 bus companies included in the railroad group reported such arrangements; in their employ were 11 per cent of the drivers employed by this group of companies. The Amalgamated and the Trainmen have signed additional agreements with bus operators in recent months. The former has included shop and garage employees, ticket agents and clerks, as well as drivers, in its organizing efforts.

The Machinists also have worked out a considerable number of agreements, some of which are not confined to mechanics. Organization among terminal and office employees is very limited.

The report discusses the manner of determining wages, hours, and working conditions and the handling of grievances and questions of interpretation under the terms of the agreements. The specifically worked out written agreement has been the exception rather than the rule in motor transportation. An analysis of the contents of a number of agreements is presented and a considerable number of agreements are reproduced.

Company unions are said to be relatively unimportant in the trucking field and a major factor only among companies embraced in the railroad bus reports.

A review of the labor disputes which have occurred in the bus and truck fields is presented, and cases which have come before the National Labor Relations Board and its predecessors are described and briefed.

The chapter closes with a brief statement of the position of organized labor on matters of legislative policy and with a condensed summary of the wage and hours provisions of selected agreements.

Enlarged Twin Cities Zephyrs Placed in Service by Burlington

(*Continued from page 935*)

easily operated trap door in the table gives access to the entire set of controls.

All car trucks are four-wheel, double-equalizer, swing-bolster type with 33-in. wheels on an 8-ft. wheel base. The castings are of nickel steel, double annealed and drawn. The equalizers, spring-hanger safety straps, crossbar and swing hangers are steel forgings. The journals throughout are fitted with Timken roller bearings. Four Houde hydraulic shock absorbers are applied on each truck to dampen the lateral swing action of the bolsters, and the application of special low cold flow rubber has been made at the points necessary to control the transmission of sound. The trucks are fitted with Simplex unit-cylinder clasp brakes.

The Locomotive

The locomotives for these trains are essentially identical with the first units of the two-unit locomotives

(*Continued on page 956*)

Motor Transport Section

A Line-up of Railway Express Agency Trucks at Pennsylvania Express Terminal in Long Island City, N. Y.

Express Operations at New York

Set-up for handling country's largest volume of express traffic presents fascinating picture of rail-highway co-ordination

Receiving Air-Express Shipments at Thirtieth Street Terminal

NEW YORK CITY operations of the Railway Express Agency present a fascinating picture of transport co-ordination done in the grand manner. There in the country's greatest metropolis it is but natural that this joint subsidiary of the railroads, which has offered co-ordinated rail-highway service since the "horse-and-buggy" days, should be called upon to do its biggest job.

Up to 26 per cent of all Express Agency traffic originates in the New York metropolitan area. During 1935, for example, the inbound and outbound business there totaled 33,143,601 shipments, the outbound traffic being handled in 105,438 cars on 51,062 trains; and the inbound in 97,749 cars on 58,209 trains. New York City pick-up and delivery operations require a fleet of more than 1,000 trucks, utilized on a basis equivalent to 1,739 eight-hour units.

Two Types of Station Facilities

To handle express business two types of station facilities have been developed—the so-called assorting sta-

tions and the terminals. These may be combined at smaller points but in New York the former are off-track facilities, strategically located throughout the city to serve the pick-up and delivery trucks. The terminals are on-track facilities where express cars are received and forwarded. The largest assorting station in the country is located in the Port Authority Commerce building, which occupies the New York City block bounded by Eighth and Ninth avenues and Fifteenth and Sixteenth streets. The country's largest on-track express facility is Pennsylvania Express Terminal, located within the Pennsylvania's Sunnyside yard area in Long Island City, N. Y., directly east of upper Manhattan. Since the operations of these are respectively typical of all New York assorting station and terminal practices, they will be described herein.

The assorting station, as stated above, is located in the Port Authority Commerce building, the basement and first floor of which comprise Union Inland Freight Station No. 1, leased to New York railroads jointly. The railroads use the street-level floor for a joint l.c.l. station, and have sub-let the lower floor to the Express Agency. This facility, the construction features of which were described in the *Railway Age* of March 25, 1933, is designated "Inland Terminal" by the Express Agency.

The Assorting Station

Inland Terminal has an island-type platform, 600 ft. long and 92 ft. wide, with under-cover back-up spaces for approximately 90 highway vehicles. Here in the course of an average day 300 pick-up trucks arrive to deposit 35,000 to 40,000 outbound shipments, and 225 delivery trucks depart for consignee doors with 15,000 to 17,000 inbound shipments. The pick-up trucks converging there serve the Manhattan area between Spring and Thirtieth streets from the North to the East river; delivery trucks radiate throughout virtually the same territory, going a little further south to the Battery and north to Thirty-fourth street.

Inland Terminal is ideally designed for an assorting station. And coupled with this are the carefully worked out truck schedules, bringing the maximum utilization

Unloading a Pick-Up Truck at Inland Terminal

of vehicles as another contribution toward a smoothly efficient set-up. Also, the nature of the express movement is such that the entire station can be turned over to pick up operations for one part of each 24-hr. period and to delivery operations for the remainder. Outbound business starts to arrive on pick-up trucks about 5 p.m. and continues to come in until about 8 p.m. It is all on its way to rail heads by 9 p.m. Inbound business is arriving from rail heads more or less continuously from 10 p.m. until 11 a.m. the following day, the greatest volume being between midnight and 7 a.m. With the three daily deliveries completed by early afternoon this business is all out of the way before the outbound shipments begin to come in around 5 p.m. to start a new cycle.

The operation, along with the plan for maximum utilization of highway vehicles can perhaps best be explained by following a truck through its daily routine. Such a truck, having covered its pick-up route, enters Inland Terminal at Eighth avenue and Fifteenth street, where an incline driveway leads down to the platform. It is

On the Platform at Inland Terminal, the Express Agency's Largest Assorting Station, Through Which from 50,000 to 67,000 Inbound and Outbound Shipments Are Handled on an Average Day

backed into any vacant space along the platform's Fifteenth-street side. There, adjacent to each back-up space, is already a line-up of platform trucks—at least one for each rail terminal and perhaps two or more for some on which pre-classifications are made. These platform trucks are placed in semi-circular fashion on floor spaces marked out and numbered to correspond with terminal-identification numbers of the back-up spaces for trucks placed on the platform's opposite side to receive loads for movement to the several rail heads. As the packages are removed from the pick-up truck a checker places on each its terminal-identification number to guide loaders in their loading of the platform trucks. As the latter are filled they are moved across the platform and spotted adjacent to the proper rail-head truck.

When a pick-up truck has been unloaded it is moved around the platform to a back-up space on the station's Sixteenth-street side, there becoming immediately available for loading to a rail-head station. On this Sixteenth-street side there is a duplicate line-up of highway vehicles for the assorting station-rail terminal movement, thereby eliminating long runs of platform trucks. Because of this arrangement it has not become necessary to employ tractors for moving the platform trucks. When the truck, now converted into a transfer vehicle, receives its load for a rail terminal it proceeds to that point, and, if such be available there, it may bring a load of inbound matter back to Inland Terminal. On the other hand, since most of the outbound business moves to rail terminals in early evening while the bulk of the inbound arrives in the early morning hours, the truck may remain at the rail-head terminal to await an inbound load; or it may return empty to Inland Terminal and take its place in the line-up of trucks being loaded for the next day's deliveries. The latter is the usual routine with respect to some 80 electric trucks which are parked at Inland Terminal for charging between midnight and 8:30 a.m., meanwhile being loaded for delivery work.

In setting up the station for the handling of inbound business the delivery trucks are placed along the platform's Fifteenth-street side. Trucks from rail heads bring in the shipments and deposit them on the platform's Sixteenth-street side. Only half of the latter is required for this operation and each back-up space of that half has above it a large placard bearing a Manhattan street directory. Adjacent to each inbound transfer vehicle's back-up space is placed a platform truck corresponding to the delivery trucks then loading on the platform's opposite side. Contrary to the practice with respect to outbound business, inbound shipments are not marked with route-identification numbers as they are taken off the transfer trucks. The sorter merely calls out the route and the loader places the package on the proper platform truck. The street directory is overhead to aid sorters in this connection. When a platform truck is loaded it is moved to a spot across the platform adjacent to the proper delivery truck; the latter is then loaded according to its route's pre-load chart which appears on a placard above its back-up space. With the loading completed the truck starts on its delivery run.

There are on Manhattan four assorting stations and operations are substantially similar to those of Inland Terminal at all except the so-called Thirtieth Street terminal located in that street between Seventh and Eighth avenues. There, where the force is on duty for but one shift (3 p.m. until midnight), only outbound rail-express shipments are handled. The facility is, however, also the city's concentration station for all of New York's air-express shipments. In the latter connection trucks move between Thirtieth Street terminal and Newark (N. J.) airport on schedules which tie-in with flights of express planes. Each day approximately 800 outbound and 200 inbound air-express shipments are handled there.

A View of the Carloading Operation at Pennsylvania Express Terminal Where an Average of 78 Outbound and 52 to 60 Inbound Express Cars Are Handled Daily

New York's Rail-Head Express Terminals

Transfer movements of rail-express shipments are made between New York assorting stations and eight different rail-head terminals in addition to special movements to city passenger terminals in order to place shipments requiring expedited service on such trains as the Pennsylvania's Broadway Limited and the New York Central's Twentieth Century Limited. Of the eight rail-head terminals three are located in Jersey City, N. J.—one serving the Baltimore & Ohio, the Central of New Jersey, the Reading and the Lehigh Valley, and the other two serving separately the Erie and the Pennsylvania. At Weehawken, N. J., is one terminal serving both the West Shore and the New York, Ontario & Western. In the Bronx is the facility at St. Anne's avenue and East 132nd street which serves the New York, New

Haven & Hartford, while on Manhattan at Tenth avenue and Thirty-fourth street is the so-called West Side Terminal serving the New York Central. The operation on the New Haven is one of the city's largest, while the volume of business at West Side Terminal rivals that of the Pennsylvania Express Terminal or "PXT" in Long Island City, which, as stated in the foregoing, has been selected as a typical large-scale terminal operation for description herein.

The construction features of "PXT" were described in detail in the *Railway Age* of August 13, 1927. The terminal building covers approximately 245,000 sq. ft. or over 5½ acres; it is surrounded on three sides by approximately 126,700 sq. ft. of concrete driveways which permit the movement of from 300 to 400 highway trucks without congestion. Within the terminal the main area is occupied by six tracks with a total capacity of 92 cars and by wide loading and unloading platforms, at car-floor height, between adjacent pairs of tracks and along the sides and east end of the building. The latter provide back-up spaces for 200 highway trucks. Here on an average day 70,000 outbound and 15,000 to 16,000 inbound shipments will be handled. The former are loaded for rail movement into an average of 78 express cars and the latter are received in from 52 to 60 cars. In addition to its work of receiving and forwarding rail shipments this facility also serves as an assorting station for part of Brooklyn and Long Island, as far as Jamaica, but excluding the latter.

As is the case at the assorting station, so also at "PXT" is it possible to set-up virtually the entire facility at different portions of each 24-hr. period for the handling in turn outbound and inbound business. The outbound shipments begin to arrive from assorting stations in the early evening hours, with the greatest volume between 6 p.m. and midnight. While inbound shipments are arriving more or less continuously the great bulk comes in after 1 a.m. and virtually all of such business has been despatched to assorting stations by 10 a.m. During the evening and up to midnight five tracks are occupied by cars being loaded with outbound shipments, while one track is assigned to inbound business. From midnight until 10 a.m. three tracks are required for inbound cars.

Cars being loaded are spotted in the destination order in which they will be made up into the passenger trains or solid express trains in which they move out of the Pennsylvania's Sunnyside yard. Three or four direct exclusive express trains, carrying up to 23 cars each, are assembled from "PXT" each night.

With the facility set up for outbound business trucks arriving from assorting stations back up to the platform where at each back up space there is a line-up of platform trucks—one or more for each car then being loaded. Sorters take the packages from the highway vehicle and tell carriers upon which platform truck it is to be placed. When a line-up of platform trucks has received loads destined to cars on one of the tracks a platform tractor takes the trucks in tow and proceeds along the platform adjacent to the corresponding line up of cars, dropping each truck at the proper car. There the lading is stowed into the car in accordance with a pre-loading chart.

Meanwhile the highway truck, having discharged its load, proceeds around the platform to another back-up space where it may be utilized immediately to carry an inbound load back to an assorting station. Or, if it be an electric truck, it may be parked at "PXT" for charging during the remainder of the night, becoming available for loading with inbound business arriving during the early morning hours.

Inbound business arriving at "PXT" is first taken from cars and placed on the platform in order that the cars may be released expeditiously. About each pile is spotted a line-up of platform trucks—one or more for each of the assorting stations. When the matter has been classified on the platform trucks, the latter are moved by tractor to the proper back-up spaces of motor trucks loading for the assorting stations. These transfer trucks proceed to the off-track facilities where, as explained in the foregoing outline of operations at Inland Terminal, they discharge their loads and, without unproductive time, assume the role of delivery trucks.

The 1,037 highway trucks which comprise the Express Agency's New York fleet are mostly of 2½-to-3½-ton capacity, although there are some larger vehicles. The 2½-to-3½-ton sizes have been found best adapted to those New York conditions wherein a vehicle may be virtually all day working one block, thereby becoming in effect a movable express office for that block; and to the shifting roles of pick-up truck, transfer truck and delivery truck which the maximum utilization plan requires each vehicle to assume. Most of the trucks follow out this routine without continuous direction by dispatchers. The Express Agency does, however, employ at New York 10 truck dispatchers who control the movement of all vehicles in transfer service, including some 50 so-called "free lance" trucks. The latter are available at all times for special movements.

Arlington & Fairfax Uses Passenger Auto-Railers

AUTO-railers, available for service on both rails and highways, have been in maintenance of way revenue freight service on some railways for several months. The first regular installation in passenger service was made on December 9, when several of this

Type of Auto-Railer Used by the Arlington & Fairfax

type of interchangeable equipment were put in operation on the Arlington & Fairfax. It is the intention to put on between 16 and 20 auto-railers within the next 60 days.

Under the new set-up, the road, which operates from Roslyn, Va., to Green Valley via Arlington Cemetery and Fort Meyer on one branch and from Roslyn to Fairfax via Clarendon, Falls Church and Vienna on the main line, is being completely rehabilitated. Service is being increased, with full 20-hr. schedules maintained at all times. The auto-railer units, ranging in passenger capacity from 20 to 27 persons, are equipped with complete Evans heating and ventilating systems, and it is expected that their all-aluminum construction and economical motive power will reduce operating costs by more than 40 per cent over the cheapest type of electric rail vehicle. Riding the rails on its own rubber tires and held in position by flanged pilot wheels, the auto-railer may be converted into a highway bus at any grade crossing, and the Arlington & Fairfax has applied for permission to leave the rails at the Roslyn terminal and carry through passengers to downtown Washington. The convertible feature is now being used at several places in the operation where the vehicles leave the tracks to make turns at shuttle points.

Bureau of Census Trucking Reports

THE Bureau of Census of the Department of Commerce has released the first three of a series of regional reports on the motor trucking industry. This regional series will be followed by a final report giving detailed information on such topics as revenues, employment data and detailed inventories by type of vehicle, capacity and age. Bus transportation will also be included in the survey.

In 1935, according to the bureau, 3,904 trucking companies with headquarters in the New England states received $44,717,000 in revenues. These companies reported an average of 13,818 employees for the year, and during October, 1935, operated 12,578 vehicles, counting semi-trailers and tractors as separate vehicles. The companies engaged in interstate hauling accounted for 50.1 per cent of the total receipts, although they represented only 10.7 per cent of the total number of companies. The revenue from all sources for interstate truckers was $5,141 per vehicle operated.

The second report in the series deals with the district comprising the states of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming. In 1935, 2,439 companies with headquarters in this district earned $16,676,000. These companies reported an average of 4,386 employees for the year, and, during October, 1935, operated 5,881 vehicles. The companies engaged in interstate hauling accounted for 29 per cent of the total receipts, although they represented only 7.3 per cent of the total number of companies. The revenue for interstate truckers averaged $4,594 per vehicle operated.

In 1935, 3,225 companies in the states of Arkansas, Louisiana, Oklahoma and Texas, earned $27,992,000. These companies reported an average of 11,016 employees for the year, and, during October, 1935, operated 11,169 vehicles. The companies engaged in interstate hauling amounted to 5.6 per cent of the total and accounted for 21.2 per cent of the total revenue.

Trucks for Water Service

THE Chicago, Rock Island & Pacific has purchased six motor trucks from the International Harvester Company for use by its water service department. The Rock Island has 342 water stations for supplying water for locomotives, shops and terminals, 168 of these also having treating plants for improving the water for boiler use. These plants are widely distributed over 14 states and 8,200 miles of lines, requiring much traveling on the part of water service men.

On many of the light traffic lines, the water service repair men lost much time because of the infrequency of train service, and, on the heavy traffic lines, the use of track motor cars by these men was hazardous and resulted in delays, while traveling by train meant loss of time and traveling outside of working hours. A study was made, therefore, to determine the best method of overcoming this, with safety for the employee, efficiency in the work, and economy to the railway. This survey indicated that trucks operating on the highway could accomplish the desired end.

One of the Six New Internationals Purchased by the Rock Island for the Water Service Department

The Rock Island has 10 operating divisions, and trucks for water service repair men were already in experimental service on two of them. These, with the six additional trucks, will equip 8 of the 10 divisions. By reason of the location of the water stations, the other two divisions do not lend themselves as readily to truck operation. However, plans are now under way to include them.

The trucks are placed at the most strategic location on the division, are assigned to the water service repair men and are used in transporting men, tools and light supplies from place to place. The trucks purchased are of the one-half ton "pick-up" type, with closed cabs, equipped for cold weather. They are provided with a four-speed transmission, which enables them to be used in pulling wells of moderate depth. Data now available show that the operating cost per mile is 5.1 cents, which includes interest on first cost, depreciation (five-year expectancy), fuel, lubrication, insurance, license, driver's permit, garage hire, and all incidentals.

Snow Buses Have Proved Exceedingly Popular

Selling Bus Service on the Maine Central

Northern New England line features summer and winter resort travel for all-year business

THE Maine Central Transportation Company had its beginnings on August 1, 1925, when bus service was instituted between Portland, Me., Bridgton and Harrison in co-ordination with train service. On June 15, 1926, bus service was instituted between Ellsworth, Me., and Bar Harbor, in conjunction with train and boat service. This permitted the discontinuance by the railway of an expensive boat operation between Mt. Desert Ferry and Bar Harbor. This initial bus service remains in successful operation.

On February 3, 1930, another substitution of buses for branch line train service was made, between Bangor and Bucksport. Further train substitution services were established, and, on October 1, 1931, a through bus line between Bangor and Portland marked the first bus service to parallel the main line of the railway. This line was established to meet the demand of a large percentage of the traveling public for bus service, the Maine Central feeling that, as the transportation agency serving this section of Maine for many years, it should provide bus as well as train service to meet the public demand.

Continued Growth

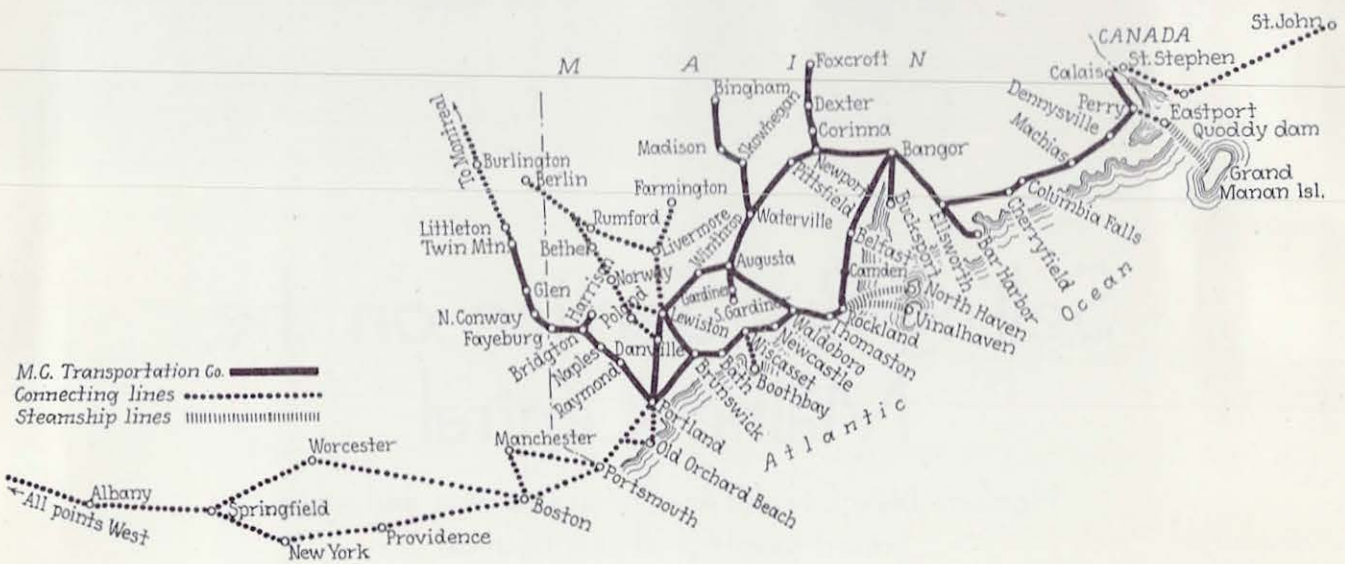
The Maine Central Transportation Company has continued to expand its lines, as shown on the accompanying map, adding new routes each year, the Canadian border having been reached on June 21, 1935, when the Bangor-Calais line was opened, providing through connections with the Maritime provinces of Canada. This year, during the summer season, a route was extended to Twin Mountain in the White Mountains of New Hampshire.

Another development was the establishment of routes for the handling of express, baggage, mail, and, in some instances, of merchandise freight. Such routes operate between Ellsworth and Bar Harbor, between Dover-Foxcroft and Newport and between Waterville and Bingham, each solving a vexing branch line problem involving train operation. Meanwhile, close connections were established between the Maine Central Transportation Company, its parent railroad, the Boston & Maine Transportation Company and other connecting passenger transport lines, including steamship companies. For example, an arrangement was worked out with the Eastern Steamship Company, whereby the steamers ceased making the expensive trip to Boothbay Harbor. Steamship passengers are now handled to this destination

A Charter Tour Party at a Maine Central Hotel

from Boston and New York via steamship to Portland, and thence via M.C.T. buses to Boothbay Harbor. Not only were connecting schedules worked out with the Boston & Maine Transportation Company, but an equipment pool was established on the Boston-Bangor run, whereby through coaches are operated in each direction, the buses of the M.C.T. and the B.M.T. being used over both lines on an equal mileage basis. This has also increased the miles per bus per day for both lines on this run.

Co-ordinated schedules with connecting lines are provided also on the run between Portland and Twin Mountain, thus permitting fast service without long layovers from and to the mountain resorts of northern New Hampshire and Vermont. Close schedule connections are also made with several steamship lines serving the islands off the Maine coast.



The Maine Central Bus Lines Cover Maine's "Holidayland"

Good Salesmanship

Serving the vacation land of Maine, the Maine Central Transportation Company has made good use of the natural advantages afforded by this resort section. In conjunction with the two hotels operated by the railway, a number of attractive trips for large parties have been worked out on special buses chartered for the occasion. An innovation that proved popular and attracted many passengers last summer was all-expense tours. An ingenious variety of tours was offered, including trips by bus to historic spots, quaint seaside towns and summer resorts, longer trips including overnight stops at Maine Central hotels, a combined bus-river boat trip, and a trip by bus to the foot of Mount Washington, thence to the summit via cog-wheel railway. Attractive booklets and other advertising regarding these trips were given widespread distribution. This type of all-expense tour proved so popular that the number and variety of these trips is being materially expanded for the coming season.

Special tours worked out by the M.C.T. are not confined to the summer season. Alternate snow trains and snow buses were operated successfully through last winter to various winter resorts for those desiring to ski, toboggan or skate and these will be continued this winter. In general, the M.C.T. has taken full advantage of the attractiveness of the territory it serves to produce greater passenger revenues by alert sales and advertising methods.

The Drivers are Carefully Selected

Parties of more than 200 people have been handled in special caravans consisting of five to eight buses, on tours covering practically all of Maine. The transportation company also moves 500 boys and girls yearly to and from the summer camps in Maine. Since they usually arrive or depart on the same day, considerable preparation is necessary for the handling of this movement, particularly since some of the roads through the woods to the camps are mere trails. The entire corps of drivers is, however, carefully chosen and educated in safety, about half of them being selected from train, engine and other branches of railroad service, and the youngsters are transported in safety and comfort each year.

Equipment

The Maine Central Transportation Company owns 27 buses and 5 trucks, including the most modern types for main line service. The maintenance schedule is worked out on a mileage basis. However, since more buses are needed in summer than in winter service, the overhauling and painting program is so arranged that as much of the work is done during the slack winter season as possible, so as to provide the greatest equipment availability for the busy summer season.

Modern Pacific Greyhound Terminal

ON September 1, the Pacific Greyhound Lines opened one of the country's most modern bus terminals, costing approximately half a million dollars, at Sixth and Los Angeles streets in Los Angeles, Cal. The new station is one of the busiest in the West. Buses leave at frequent intervals north, south and east, serving over 50,000 miles of highway throughout America. Every day 14 schedules leave for San Francisco and points north over coast and valley routes; 14 buses leave daily for San Diego and points south, in addition to the many local and transcontinental schedules.

Interior Arrangements Provide for the Comfort of the Passengers

Design and Layout

The exterior of the building is of modern architectural design, while the interior has been carefully planned for use solely as a bus terminal. Special care has been taken to include the latest ideas in station design. On the ground floor ticket offices, waiting rooms, rest rooms, telephones, and coffee shop are so arranged as to be easily accessible to passengers. Architecturally the interior is in harmony with the exterior—modern, clean and spacious. The entire flooring is covered with rubber, while the walls and ceiling are tastefully decorated. The construction of the new building has been carried out by the Atlas Construction Company of Los Angeles, under the supervision and direction of W. D. Peugh, architect, of San Francisco.

The Exterior of the Station is Artistic

Greyhound Mergers Authorized by I. C. C.

WASHINGTON, D. C.

THE merger of certain companies of the Greyhound Lines into seven groups was authorized by Division 5 of the Interstate Commerce Commission on December 19. The groups will be headed by the following companies: Atlantic Greyhound Corporation, Pacific Greyhound Corporation, Southwestern Greyhound Lines, Inc., Central Greyhound Lines, Inc., and the Capitol Greyhound Lines. There were originally thirteen of these groups, but four of them were not involved in this program. The revenue act of 1936 is given as one of the principal reasons for these mergers as the companies feel that the only practical way in which a profitable subsidiary can be merged with the parent corporation, without incurring what they term a "confiscatory" capital gains tax, is by complete liquidation. The new tax law is also responsible for the Greyhound Corporation's intention to create new corporations to take over certain intrastate operations in California, Indiana, and Illinois. The laws of those states and also of Virginia provide that certificates for intrastate operations shall be issued only to domestic corporations. To comply with those statutes it has been necessary in each of the groups which operated in those states to have a subsidiary company capable of holding title to the local operating rights. In addition to the tax savings, the mergers will simplify the corporate structure of these companies and bring about economies in administration, accounting, and financing and simplify relations with public authorities, state and federal. Inter-company transactions also would be simplified. The report includes

a discussion of the railroad interest in the Greyhound Corporation as follows:

"Ownership of the stock of several of the surviving corporations has, since prior to October 1, 1935, been shared with one or more railroads, the bus routes, according to applicants, in such instances being generally parallel to the lines of the railroad or in the same general territory. In all cases, except one, the railroad was engaged in the business on its own account prior to the partnership arrangement, and in most cases, at a financial loss. After inauguration of the partnership arrangement, operations have proven substantially profitable.

Directorate of the Railroad Affiliates

"A numerical majority of the board of directors of each company in which railroads have an interest consists of officers or directors or nominees of the corporation, except in three cases. The latter are Northland Greyhound Lines, Inc., Pennsylvania Greyhound Lines, Inc., and Central Greyhound Lines, Inc. In each of these cases, the board of directors consists of an even number, of which one half are representatives of the railroads, and the other half of the corporation, but with management by contract committed to the corporation. For the latter reason applicants deny that the companies involved are managed in the interests of the railroads, although it is applicants' position that they have coordinated their facilities and services with those of the railroads in so far as the same are conducive to the interests of the applicants as independently owned and operated motor carriers. This coordination has been accomplished by joint station facilities, joint ticket offices, joint rates, and in mutually handling the traffic of one another in times of emergency.

"In this case, whatever interest railroads may have in Greyhound lines was acquired before the act became effective and will in no way be changed by the mergers proposed. Without undertaking to decide for present purposes, therefore, what degree of interest railroads may have in Greyhound lines, it is our opinion that the proviso in section 213(a) (1) has no application."

Enlarged Twin Cities Zephyrs Placed in Service by Burlington

(*Continued from page 947*)

built by the Electro-Motive Corporation for the Denver Zephyrs.* Each is equipped with two 900-hp., two-cycle Diesel engines directly connected to General-Electric generators driving two motors on each of the two swivel trucks. The locomotive is 58 ft. 1 in. long, from the anti-climber at the front to the face of the rear coupler knuckle, with trucks placed on 34-ft. centers, and weighs 222,520 lb. This locomotive contains no heating plant, the heating boilers, as already indicated, being included in the train power plant at the front end of the first revenue body unit.

The locomotive and train are connected by O-B Tight-Lock couplers. The locomotives and each body unit in these trains is named. The names applied to the two trains are shown in a table. Tables are also included showing the lengths of body units and the weights by trucks.

* For a description of these locomotives see the *Railway Age* for November 7, 1936, page 669.

New Book . . .

The St. Lawrence Deep Waterway—A Canadian Appraisal, by C. P. Wright. 450 pages, 8½ in. by 5¼ in. Bound in cloth. Illustrated with maps and diagrams. Published by the Macmillan Company of Canada, Ltd. Price $4.50.

This is a critical study of the proposed St. Lawrence deep waterway development and the treaty in connection therewith which was rejected by the United States senate. His "principal purpose," the author says in his preface, has been "to present a plea for a full and impartial consideration of the undertaking itself and the treaty for its execution"—a purpose which "still holds good, even though the reasons for holding it have undergone some change." He points out how, "in most extraordinary contrast" to the succession of surveys and engineering studies of the feasibility of constructing the waterway, the "economic prospects of the undertaking appear to have received no such scientific and repeated consideration." With this thought uppermost Dr. Wright proceeds to discuss in turn the making of the treaty, the economic aspects of the waterway and considerations upon the treaty. In the second conection considerable attention is given to the problem of adequate depth and to the problem of Canadian need. All of which, the publishers say, comprise the first critique of the project to have been written "from a wholly Canadian point of view."

A Communication . . .

Standard Box Car

GLOUCESTER, MASS.

TO THE EDITOR:

For the last three years I have been spending part of my time in other countries and have to some extent lost track of railway affairs in America. Recently, however, I saw some new steel sheathed box cars, built by the Pullman-Standard Car Manufacturing Company for the Minneapolis, St. Paul & Sault Ste. Marie, and had the opportunity of inspecting them. I was informed that they measured 9 ft. 2 in. wide INSIDE, as well as 40 ft. 6 in. in length *inside*, some being 10 ft. high *inside*.

I emphasize the word INSIDE, because it seems to me that all previous standard box cars, when prescribed by the Association of American Railroads, have been designed with certain outside dimensions, letting the inside dimensions fall where they may. In other words, the new cars appear to have been designed for traffic loading and not entirely for clearances. This is confirmed by the information that the first design of the Mechanical Division of the association took into account the clearances alone, with the result that the original inside width was 8 ft. 9⅛ in. wide.

The change of heart is expressed in a letter from an officer of the association, who writes me that "due to a change in traffic demands" some railroads have increased the width to 9 ft. 2 in.; that the Mechanical Division is again revising these standards; and that the prospect is that the last named will be the official width.

An abstract of the address which I made at a meeting of the Master Car Builders' and Supervisors' Association in Detroit in 1930 was published in the *Railway Age* of September 6, 1930, and if you will peruse this abstract, you will find that I then urged about all the important features incorporated in the new cars. I think that while I was vice-president of the Queen & Crescent we were the first in the South, and among the first in the country to install a continuous steel center sill in wooden cars, replacing two of the wooden members. (Some roads still own all-wood center sill cars).

Sincerely,
T. C. POWELL,
Former President, Chicago & Eastern Illinois R. R.

Odds and Ends . . .

Luck of the Rodmen

Good advice to a young man desiring to become president of the Norfolk & Western would be to start as a rodman. Four of the seven presidents the N. & W. has had began as rodmen, one as a station agent and one as a fireman.

All-American

Bill Hewitt, former All-American with the University of Michigan, later with the professional Chicago Bears for several seasons, and rated by all sporting authorities as one of the best ends who ever played football, has become an apprentice in the traffic department of the Illinois Central.

Unusual Hobby

Railroad lantern collecting is the unusual hobby of a New Britain, Conn., man, who has 90, representing 40 railroads from New England to the Middle West. He has found them along railroad tracks, in attics, cellars, antique shops, and junk heaps. Two date back to 1860, one used by the Adams Express Company and the other from the New York, Lake Erie & Western.

Farmer President

Fred W. Sargent, president of the Chicago & North Western, owns and operates several farms near Mount Vernon, Iowa, but he is by no means a gentleman-farmer or absentee landlord. He really works at farming, and, in one field of 700 acres, he is experimenting with 31 varieties of soy beans. The buildings on his farms are painted with pigments mixed in an oil that is 53 per cent soy bean oil, probably the highest soy bean content oil ever put to extensive use.

Half Century in a Bottle

Forty-seven years ago, Mike Ehrman, retired pipefitter foreman of the Norfolk & Western, Portsmouth, Ohio, shop, helped to build a storehouse in Portsmouth. With two other workmen he conceived the notion of leaving behind a memento of their work. The trio wrote and signed a note which wished the finder good luck. The message was enclosed in a bottle, which was sealed in the wall of the building. After standing nearly half a century, the structure was recently torn down. Workmen found the bottle and extracted the note, dated June 29, 1889.

Small Railroads

CORNING, N. Y.

TO THE EDITOR:

I have noticed reference in your December 5 issue to the "Smallest United States Railroad." While Mr. Frink mentions the Warrenton railroad as being only three miles long, there are several roads only one mile long: The Augusta railroad, with one locomotive and one car, and the Etna & Montrose, equipped with three locomotives and no cars. We also have several roads two miles long: Among them being the Caddo & Choctaw, equipped with 2 locomotives and 100 cars; the Dexter & Northern, with 2 locomotives and 12 cars; and the York Utilities Company, with 2 locomotives and 7 cars.

P. V. MILES
Corning Glass Works

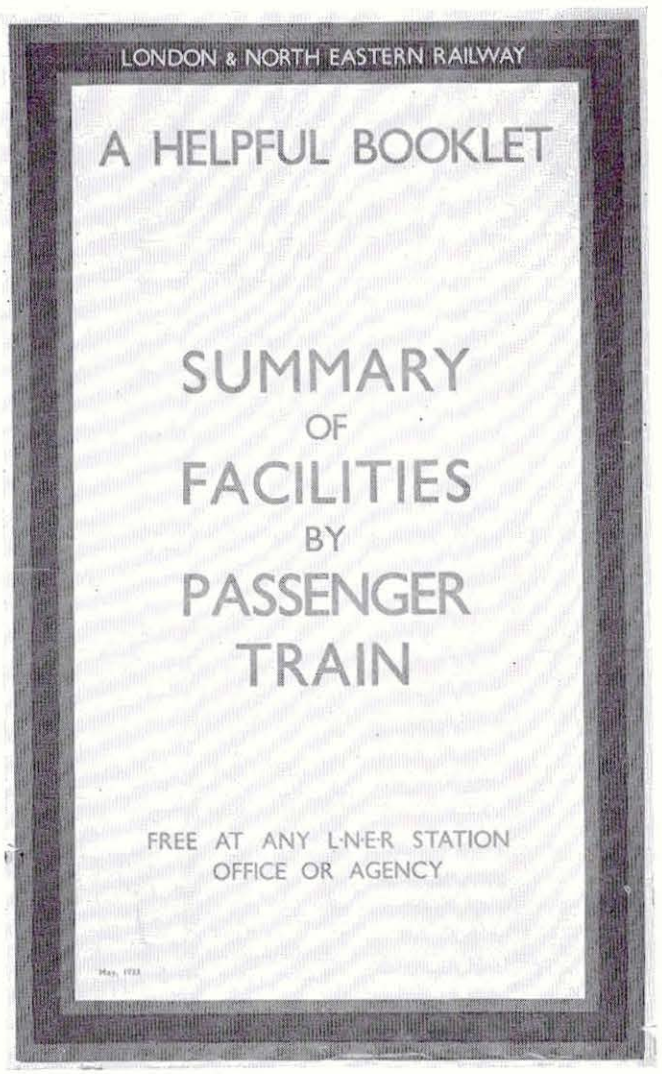
Lions on the Erie

Agent W. A. Boggia, of the Erie, at Leonia, N. J., has become a lion tamer, much against his will. Recently a pair of 440-lb. African lions arrived at Leonia from Tulsa, Okla., but the consignee has been unable to pay the express bill, although he does stop in daily with 20 lb. of raw meat for Agent Boggia. Only one bright spot has occurred to the harrassed Boggia. Lions do not breed as rapidly as guinea pigs, so that it is unlikely that he will find himself in the predicament of the unfortunate station agent in "Pigs Is Pigs." One must say for Boggia, however, that he has thought up an original excuse for getting rid of the lions. He has urged the consignee to pay the bill and take them away "before he grows too fond of them."

New Source of Revenue

Mushroom settlements, complete in every modern detail, will spring up overnight in London's suburbs for coronation week. At the end of the week, the inhabitants will "fold their tents like the Arabs, and silently steal away," for the overnight settlements will be camping coaches, mobilized at strategic suburban points by the London & North Eastern, to help relieve the pressure on hotel and boarding house accommodations in London during coronation week. These camping coaches, which are sent to beauty spots in the provinces and Scotland in the summer months, will each accommodate six people and will be let at a rental of £10 (about $50) for the coronation week to visitors to London. Each coach is fully equipped with cutlery, kitchen utensils, crockery, bed and table linen, blankets, lamps, stoves, chairs and everything likely to be required, even down to ashtrays and a soapdish. The rental will also include a free ticket from the suburban station to the London terminus every day of the week for all six members of the party, so that the only additional expense will be the cost of food.

* * *



Whenever the English Railways Issue a New Booklet They Publicize It Extensively With Huge Posters in Colors

NEWS

Most Rail Labor Disputes Are Peacefully Adjusted

National Mediation Board cites the record as indicating wisdom of 1934 legislation

The second year of administration under the 1934 amendments of the Railway Labor Act "gives clear indication of the wisdom of that legislation in the development of stable labor relations in the railroad industry," according to the annual report of the National Mediation Board. "The peaceful adjustment of labor disputes on the railroads that has been maintained since the enactment of the Railway Labor Act in 1926 has not only been continued under the amended law but there has developed a broader spirit of cooperation between men and management that gives promise of an ever increasing tendency to settle disputes on the several properties by the parties themselves without the necessity of intervention by Government agencies.

"With the exception of the hasty action on a small industrial railroad of less than 40 employees, who, before ceasing work failed to request mediation in keeping with the intent of the law, there was no strike and no interruption of railroad service on account of labor disputes. All differences were settled peacefully either directly between men and management or by the agencies provided by the Railway Labor Act.

"The outstanding manner in which peace has been maintained on the railroads would be no credit to the industry if serious differences did not constantly arise between the carriers and their employees similar to the disputes that break out in strikes in other industries. The fact is, however, that railroads are no different from other industries in the number and character of labor disputes that they have. As may be seen in another part of this report, over 200 such disputes were serious enough to require the intervention of the National Mediation Board, and over 1500 were referred to the four divisions of the National Railroad Adjustment Board, which by section 3 of the Railway Labor Act is given jurisdiction over disputes growing out of grievances or involving interpretation or application of agreements between carriers and employees. For every dispute submitted to either of these Boards, there were many others considered and settled in conferences between representatives of carriers and of the employees as required by section 2, second, of the act.

"How serious some of these disputes have been is evident from the fact that during the year the employees on 11 railroads took strike votes after the first attempts at mediation had failed, and voted to withdraw their services. In all these cases, however, the Board was able to arrange for peaceful settlements to be made by further negotiations and mediation, and thus to avoid the necessity for strike action. That peaceful relationships have been maintained throughout the industry under these circumstances, is a tribute no less to the efficiency, fair dealing, and industrial statesmanship of the managements of the railroads and of the representatives of the employees and their organizations than it is to the Railway Labor Act itself."

October Locomotive Shipments

October shipments of railroad locomotives, as reported by the country's principal manufacturing plants to the United States Department of Commerce, totaled 10 locomotives, as compared with 13 in September and two in October, 1935. Unfilled orders at the close of October totaled 130 locomotives as compared with 37 on October 31, 1935.

Oil Lanterns Not Allowed in Illinois

The Illinois Commerce Commission on December 18, issued an order prohibiting the use of oil-burning signal lanterns in that state. Electric lanterns must be used on all trains, freight and passenger, in switching yards, freight yards and other places where train movements are guided at night by the swinging signals of lighted lanterns. Railroads are given 60 days in which to comply; and they must furnish lanterns, bulbs and batteries.

Activities of Railroad "Fans"

E. E. Regan, assistant general manager of the New York, New Haven & Hartford, will speak on "Safety in Railroad Operation" at the next meeting of the New York Chapter, Railway & Locomotive Historical Society, to be held on January 8, 1937. Mr. Regan's talk will be illustrated by motion pictures and will be followed by showings of other films on "Snow Trains" and "The Iron Mule."

George W. Curtiss, general agent on the New York zone of the Pennsylvania, addressed 150 members and guests of the New York Division, Railroad Enthusiasts, Inc., at a meeting held on December 18. Mr. Curtiss' address, which was on "Railroads in 1936," was followed by a showing of the Association of American Railroads' new vocafilm—"All Aboard."

Report of Panama Canal for Year Ended June 30

Deficit of $947,254 after interest compares with $771,618 for previous year

During the fiscal year ended June 30 Panama Canal revenues from tolls amounted to $23,506,806, and the revenues from postal and miscellaneous receipts to $119,915, while the net revenues from business enterprises amounted to $920,185, a grand total of $24,546,906, according to the annual report of the Secretary of War. Net operating charges amounted to $9,095,067, thus leaving a balance of $15,451,839 revenue in excess of operating charges, exclusive of interest. However, including interest charges at the rate of 3 per cent per annum on the capital investment of the Canal, the operations for the year show a deficit of $947,254, as compared with a similar deficit of $771,618 for 1935. The rate of 3 per cent approximates the rate of interest paid by the United States government on funds borrowed to construct the canal. The interest charge is based on a total capital investment of $546,636,490 as of June 30, 1935, which is the actual cost to the United States government of constructing the canal and its auxiliary works. This capital investment and the expenses listed above do not include any of the expenses incurred by the government to fortify the canal nor for plant used by military forces.

Panama Railroad revenues from the operation of the railroad, commissaries, harbor terminal facilities, the steamship line, etc., totaled $13,178,466; expenses totaled $12,476,415, resulting in a net revenue from its various business enterprises of $702,051. Adding to this miscellaneous profit and loss items resulting from interest, exchange, etc., the net revenue received by the Panama Railroad for the year was $1,127,340. Dividends declared by the railroad for the year and credited to the government amounted to $700,000.

The steady growth of traffic through the canal since its opening and the progressive increases in the size of newer vessels have indicated the necessity of planning eventually to increase its capacity. Authority to start investigations along this line was authorized by House Joint Resolution No. 412, approved May 1, 1936. The purpose of this legislation was to authorize a study of the time when the present capacity of the canal should be increased and of the manner in which this increase should be made.

The Panama canal has been open to

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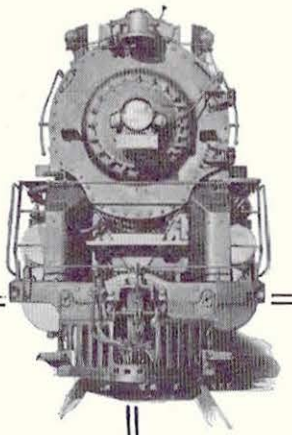
MODERN POWER..



means

HIGH HORSEPOWER

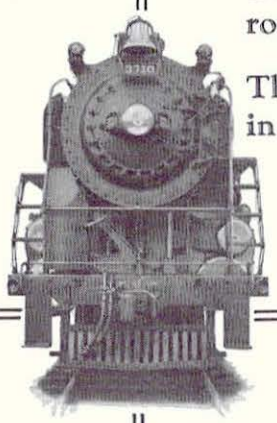
CAPACITY

Only new locomotives can provide the high horsepower capacity necessary for handling heavy, high-speed, modern trains.

This calls for a coordinated locomotive design proportioned to produce, at economical coal rates, the maximum horsepower which operating conditions demand.

Such power must combine high boiler pressure, high superheat, generous boiler and firebox proportions, proper steam distribution and light reciprocating and rotating parts.

This combination can only be obtained in new locomotives.



LIMA LOCOMOTIVE WORKS LIMA LOCOMOTIVE WORKS INCORPORATED INCORPORATED, LIMA, OHIO

commerce for approximately 22 years. During this period, exclusive of 8113 transits of vessels of the United States government which passed through the canal without the payment of tolls, transits of large, ocean-going commercial vessels passing through the canal have totaled 87,603, of which 38,702 were of American registry.

During the year 5382 ocean-going commercial vessels passed through the canal, as compared with 5180 in 1935 and 5234 in 1934. There was a slight increase in the amount of tolls collected and in the volume of cargo carried through the canal, as well as an increase in the number of transits.

The more important trade routes served by the canal and the tons of cargo moving over these routes during the past fiscal year were: Between the Atlantic and Pacific coasts of the United States, 7,719,075 tons; between the United States and the Far East, including the Philippine Islands, 3,438,159 tons; between Europe and South America, 2,726,053 tons; between Europe and Canada, 2,472,332 tons; between Europe and the United States, 2,403,568 tons; between the east coast of the United States and the west coast of South America, 2,108,384 tons; between Europe and Australasia, 1,056,821 tons; between the United States and the Hawaiian Islands, 514,666 tons; and between the United States and Australasia, 511,992 tons.

Increased Passenger Business on Long Island

Approximately 8500 additional passengers have been carried daily over the Long Island since the inauguration of the 80 additional trains which were placed in service on September 20. There are now 844 daily trains as against 764 formerly run. The 80 additional trains operate outside of the heavy commuting hours.

Atlantic Shippers' Board

The Atlantic States Shippers' Advisory Board has changed the date and the place of its annual meeting. To avoid conflicts with freight rate hearings at Washington, the date has been changed to Thursday, January 21, and the place is the Hotel Astor, New York City. The usual committee meetings will be held on Wednesday, January 20.

M. C. List, I.C.C. Attorney, Dies

M. C. List, attorney of the Interstate Commerce Commission's Bureau of Safety, died at Winter Park, Fla., on November 18 after an illness of several months. He was 60 years old. In addition to his work with the Bureau of Safety Mr. List had conducted several special investigations for the I.C.C.

New Orleans-Los Angeles Time Shortened

Faster train service between New Orleans, La., Los Angeles, Cal. and San Francisco, by the Southern Pacific will be improved on January 3, when the westbound schedule of the Sunset Limited will be cut 1 hr. 25 min. between New Orleans and San Francisco; its eastbound schedule 50 min. from Los Angeles to New Orleans and that of the Argonaut 20 min. between New Orleans and Los Angeles. Under the new time table the Sunset Limited will leave New Orleans at 12:45 p. m. instead of 11:20 a. m. and will arrive in Los Angeles at 5 p. m. the second day and in San Francisco at 8:10 the third morning as at present. It will leave Los Angeles at 10:00 a. m. instead of 9:10 a. m. and will arrive in New Orleans at 6 p. m. the third day as at present. The Argonaut will leave New Orleans at 11 p. m. as at present, and will arrive in Los Angeles at 7:10 a. m. instead of 7:30 a. m.

Operating Results, Inland Waterways Corporation

The Inland Waterways Corporation in the year ended June 30, 1936, carried a total of 2,376,336 tons, according to a brief statement of its operating results in the annual report of the Secretary of War. The corporation itself publishes an annual report for the calendar year. The gross revenue is stated as $6,900,685 and the gross expenses, including depreciation amounting to $607,042, as $6,000,915, leaving a net income of $899,769.

Florida Ship Canal Hearing

Hearings on the Florida ship canal project, for which Congress refused to make an appropriation at the last session, were held before the Board of Engineers for Rivers and Harbors at Washington on December 16, 17, and 18 on a "revisory report" recently submitted by a special board of engineers, expressing the view that construction of a sea-level canal at an estimated cost of $157,585,000 would be justified in the public interest. Testimony in opposition to the project was given by J. E. Willoughby, chief engineer, and H. V. Borjes, assistant general freight agent, of the Atlantic Coast Line, and by representatives of railroad labor organizations.

Washington Transportation Club Elects Officers

At the annual meeting of the Washington (D. C.) Transportation Club on December 17, the following officers were elected: President, G. M. Campbell, assistant general freight agent, Baltimore & Ohio; first vice-president-secretary-treasurer, C. W. Nickless, freight and passenger agent, Norfolk & Western; second vice-president, J. G. Nettleton, general agent, Pennsylvania, and assistant secretary, F. F. Crabbe, general agent, Chicago, Burlington & Quincy.

Rail Purchase Policy Before Appeals Court

The United States Circuit Court of Appeals at St. Louis, Mo., on December 18 took under advisement an application for an appeal from a lower court ruling involving the question whether bankrupt railroads should buy needed equipment with current cash resources or increase their debt to make the purchases. The case involves the St. Louis Southwestern, which District Judge Charles B. Davis placed on a "cash and carry" basis in purchasing $1,050,000 of new locomotives and air conditioned passenger coaches. Counsel for the trustees of the road, argued that the ruling was not only unfair to bondholders, who were not receiving full interest payments, but if allowed to stand would constitute a serious threat to prevailing methods of railroad financing. They argued that current earnings should be used to pay bond interest and new purchases should be made with equipment trust certificates.

Registration of Railroad Employees

With the assistance of the railroads the Social Security Board is conducting for the Railroad Retirement Board a registration of all railroad employees with information needed to identify applicants for pensions under either the social security act or the railroad retirement act. The carriers have agreed to distribute the forms for the purpose to each of their employees, to collect the forms when completed, and to return to the employees cards showing the names and identifying numbers. Railroad employees are not included under the terms of the social security act for pension purposes because of the special provision made for them in the other act but they are included for the purposes of the unemployment insurance feature of the act.

The Railroad Retirement Board has now certified some 1,500 retired railroad employees to the Treasury Department for the payment of annuities under the railroad act, for which some 25,000 applications have been filed.

I. C. C. to Define Philadelphia Commercial Zone

The Interstate Commerce Commission has instituted an investigation to determine the area and extent of the municipality of Philadelphia, Pa., and of the commercial zone adjacent to it, for the purposes of Section 203 of the motor carrier act, 1935, which exempts motor carrier operations within such zones to a certain extent from commission regulation. The proceeding has been assigned for hearing at Philadelphia on January 14 before Examiner A. J. Sullivan.

Chicago Association Asks Re-Opening of Pick-Up and Delivery Case

The Chicago Association of Commerce has petitioned the Interstate Commerce Commission to re-open, rehear, and broaden the scope of the proceeding in which the commission recently authorized the pick-up and delivery service plan of the eastern railroads, and to postpone the effective date of its order of October 13 in which the commission prescribed a minimum rate of 45 cents per 100 pounds. The association says the present record is insufficient to justify the prescription of a minimum rate.

Terms of Commissioners Eastman and Tate Expire

The terms of Commissioners Joseph B. Eastman and Hugh M. Tate of the Interstate Commerce Commission expire on

Continued on next left-hand page

EVER RIDE IN THIS "Transportation" MEANS?

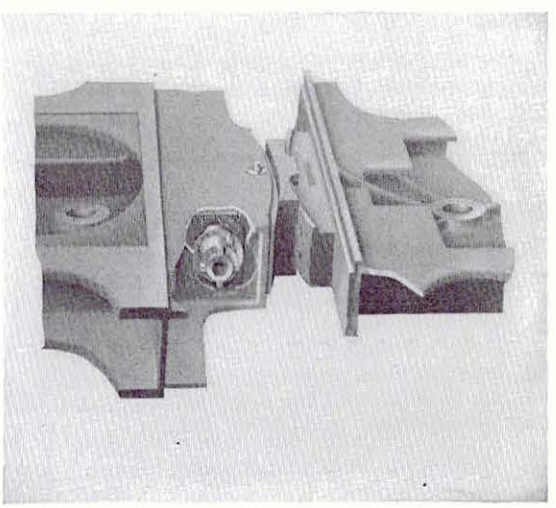
The old springless dirt wagon with its "pole" body served its purpose when nothing better was available—but at even three miles an hour riding on it was misery. The rigid buffer between engine and tender puts the locomotive in the same class—and it doesn't ride much better.

Franklin Type E-2 Radial Buffer maintains a predetermined spring held, frictional resistance between engine and tender that avoids all slack yet permits movement in any direction between the engine and tender units.

This controlled frictional resistance dampens all oscillation and greatly improves the riding of the engine.

Its twin, the Franklin Automatic Compensator and Snubber, takes the job of maintaining accurate driving box adjustment.

Together they not only vastly improve the riding of the locomotive but are also an important factor in lowering locomotive maintenance costs.



RADIAL BUFFER TYPE E-2

REG. U.S. PAT. OFF.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

December 31 but under a recent amendment to the law they will continue in office until they have been reappointed or others have been appointed in their places. Mr. Eastman has been a member of the commission since February, 1919, and Mr. Tate since February, 1930. It is understood that President Roosevelt had desired to appoint Mr. Eastman chairman of the United States Maritime Commission but that Mr. Eastman preferred to remain with the I. C. C.

Employees Honor Memory of Sir Henry Thornton

Tribute to the memory of the late Sir Henry Worth Thornton, K. B. E., former chairman and president of the Canadian National Railways, and to the esteem and regard in which he was held by railway employees, was paid at ceremonies which took place at various points throughout Canada on Thursday night of last week. The central function was the unveiling, in the Union Station, Ottawa, of a bronze memorial plaque, one of fifteen erected in honor of Sir Henry, by employees of the system. The movement was one originated and carried out by representatives of the railways' employees. The cost of the plaques was borne by the employees, members of the seventeen standard railroad labor organizations and their friends, and the speakers at the unveiling ceremony were general chairmen of the railroad unions.

Fifteen bronze memorial plaques, each 22 inches wide by 32 inches deep and weighing seventy pounds, have been erected. They are located as follows: One each at Halifax and Sydney, N. S.; Charlottetown, P. E. I.; Moncton, N. B.; Toronto, London, Ottawa and Port Arthur in Ontario; Winnipeg, Man.; Saskatoon, Sask.; Edmonton, Alta., and at Vancouver and Prince Rupert in British Columbia. Two have been erected in Montreal, one at Bonaventure Station and the other at Canadian National headquarters on McGill street. A memorial cairn is being built at Jasper National Park, Alberta, which will bear another of these bronze tablets.

Railroad Labor To Ask Six-Hour Day

Plans for pressing a six-hour day bill for railroad employees at the coming session of Congress were laid at a meeting of the Railway Labor Executives' Association in Washington last week. George M. Harrison, chairman, announced that the bill would be introduced shortly after Congress convenes next month and said that "unless unforeseen developments occur, the prospects are exceedingly favorable for its adoption." Attention was given also to seven other bills which the labor organizations will advocate: The train limit bill, the full-crew bill, an amendment to the hours of service act, the train despatching bill, the signal inspection bill, the bridge and track inspection bill, and an amendment to the federal employers' liability act. Hearings on most of these bills were held at the last session of Congress.

On December 18 representatives of the labor organizations met with representatives of the Association of American Railroads for a discussion of the "general situation."

Santa Fe to Launch Freight Service Advertising Campaign in 1937

The Atchison, Topeka & Santa Fe will embark upon a definite program of freight advertising for 1937, according to a recent announcement by C. C. Dana, freight traffic manager.

A series of twelve page advertisements, one a month, will be run during the year in a limited list of publications already chosen by the railroad's advertising department to reach executives and individuals who have to do with the routing of the nation's freight shipments.

"The field of freight advertising is still largely unexplored," Mr. Dana said, in his announcement. "There is no clearly defined background based on experience from which to draw guidance in such important matters as the selection of media and subject material and justifiable expenditure in relation to revenue. Therefore, our 1937 campaign has been limited deliberately in scope and cost. However, it is the definite conviction of Santa Fe officials that the railway system can enter the field of freight advertising with profit. The results accruing during this twelve-months campaign will be studied carefully as a guide to our activities along these lines in future years."

Santa Fe advertising officers plan to use an unbroken series of advertisements, similar in general style of layout and treatment of the news subjects to be covered in the copy. The romance of industry as it is revealed through transportation will be pictured as well as the news of developments tending toward an improved freight service.

Coach Tourist Trains to be Established by Rock Island & Southern Pacific

A new train, the "Californian," made up of the latest type of air-conditioned reclining chair cars and tourist sleepers, will be placed in daily service over the Chicago, Rock Island & Pacific and the Southern Pacific between Chicago and Los Angeles, on January 3. Beginning on the same date, the Golden State Limited, over these roads, will become an all-Pullman train. The Californian will feature "economy" dining car meals, along with "off-the-tray" food service, and free pillows for passengers. It will have east and westbound running times approximating the fast schedules of the Golden State Limited. Another feature of this new train will be a car assigned exclusively to women passengers. The Californian will leave Chicago at 8:20 p. m. and will arrive in Los Angeles at 7:15 a. m. the third morning; returning it will leave Los Angeles at 8 p. m. and arrive in Chicago at 8:45 a. m.

The regular dining car meals on the Californian will be: breakfast, 25 cents; luncheon, 30 cents; dinner, 35 cents. In addition, there will be a la carte service at low rates. Light refreshments will be served from trays throughout the train. The tourist sleepers will be of the latest improved type. The Californian will carry a special Memphis coach both east and westbound.

On the same day 35 min. will be cut from the westbound schedule of the Golden State Limited, which will carry a full-length lounge car as well as an observation car. The schedule of the Apache, eastbound, will be reduced 35 min.

New Jersey Tax Case

New Jersey railroads on December 18 received permission from Judge Forman in the United States District Court for New Jersey to submit a reargument of the case involving more than $10,000,000 in taxes assessed by that state for 1932 and 1933. Judge Forman on December 15 had rendered a decision removing the injunction which had restrained the state from collecting these taxes which the railroads contend are based on valuations higher than valuations placed on other property.

The New Jersey litigation was launched in 1931 when the railroads, although not withholding tax payments for that year, pursued through the state courts their protest, based mainly on alleged discrimination in the assessments on their property as compared to that of others. This 1931 case subsequently reached the United States Supreme Court on petition for a writ of certiorari, which was denied. The railroads since 1932 have paid approximately 63 per cent of the taxes levied and are contesting the balance, amounting to $24,733,000, in the federal courts. The 1932 and 1933 cases are involved in the present decision while in the 1934 and 1935 cases a stay on the collection of the contested amounts has been issued.

Construction

Louisville & Nashville.—This company contemplates the construction of a belt conveyor to handle nitrate at its wharves at Pensacola, Fla. It is expected that the contract will soon be awarded.

St. Louis-San Francisco.—A contract has been awarded to the Kansas City Bridge Company, Kansas City, Mo., for replacing a 250-ft. steel span over the Colorado river near Winchell, Tex., which was washed out by flood waters last fall. The estimated cost of the new structure is $65,000.

Western Pacific.—A contract has been awarded to Ryberg Brothers, Salt Lake City, Utah, for work in connection with the extension of this company's enginehouse at Oroville, Cal., at a cost of approximately $51,000. The work to be done under this contract involves the construction of six additional stalls in the enginehouse which now embodies eight stalls. To accommodate locomotives having an overall length of 118 feet, the new stalls will be 140 feet in length, or 40 ft. longer than the existing stalls. Equipment to be installed in the enginehouse addition includes a Whiting drop table and swing gates, a truck drop pit and a 100-ft. monorail hoist.

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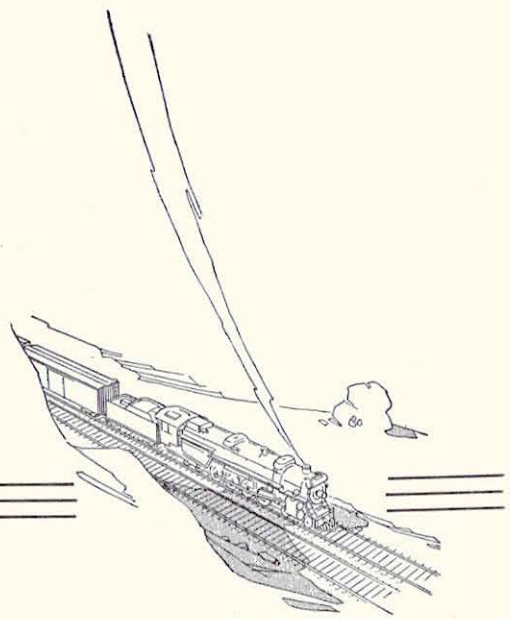
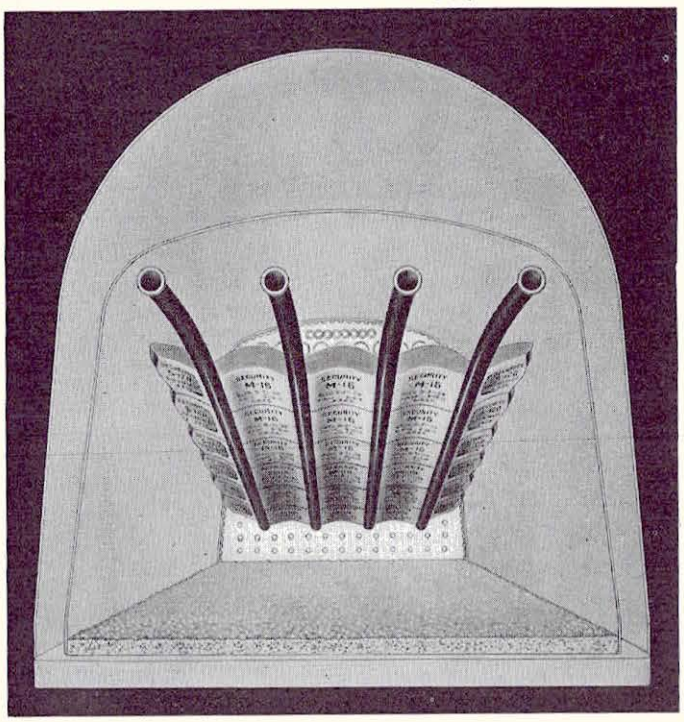
THE STANDARD
by which brick arch service is measured





The life of the firebox brick arch can be measured by only one standard—the tons of fuel burned under it in a given locomotive.

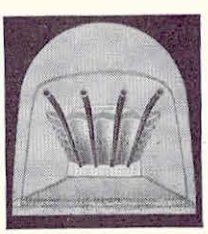
Measured by this standard the Security Brick Arch is giving greater service at lower cost than it did a decade ago.

More intensive locomotive service plus constantly improved Security Arch Brick makes the Security Brick Arch an economic factor of greater importance in fuel conservation than ever before in its history.

There's More to SECURITY ARCHES Than Just Brick

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists



AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

Supply Trade

N. M. Lower, who has been associated for several years with the **Standard Stoker Company, Inc.,** at its New York office, has been appointed works manager of the company, with headquarters at Erie, Pa. Mr. Lower has had a long experience in the stoker industry.

The General Electric Company has elected five new commercial vice-presidents as follows: **M. O. Troy,** Schenectady, N. Y., manager of the central station department; **L. T. Blaisdell,** Dallas, Tex., southwestern district manager; **E. H. Ginn,** Atlanta, Ga., southeastern district manager; **A. L. Jones,** Denver, Col., Rocky Mountain district manager, and **T. S. Knight,** Boston, Mass., New England district manager.

M. C. Blest, chief engineer of the **Pressed Steel Car Company, Inc.,** Pittsburgh, Pa., has been promoted to consulting engineer, and **J. P. Anderson,** assistant chief engineer, succeeds Mr. Blest as chief engineer. Mr. Blest has been associated with the Pressed Steel Car Company since 1901 prior to which time he spent 12 years with the Harlan & Hollingsworth Company of Wilmington, Del. (now part of the Bethlehem Steel Company), where he served in various capacities in the passenger car and ship building departments. He first served with the Pressed Steel Car Company as draftsman, in 1901, subsequently as chief draftsman and in June, 1912, was appointed mechanical engineer of the Western Steel Car & Foundry Company (subsidiary of the Pressed Steel Car Company), at Hegewisch, Ill. He went to McKees Rocks plant of the Pressed Steel Car Company in 1915 as mechanical engineer and since 1923 has served as chief engineer. J. P. Anderson entered the employ of the Pressed Steel Car Company as a draftsman in May, 1904, and subsequently served as assistant chief draftsman and chief draftsman until October, 1919. He was then transferred to Buenos Aires, South America, as sales engineer, returning in July, 1922, and was appointed assistant mechanical engineer. The following year he was transferred to the Koppel Industrial Car & Equipment Company, (subsidiary of the Pressed Steel Car Company) as assistant chief engineer and in February, 1936, returned to the Pressed Steel Car Company, at McKees Rocks, as assistant chief engineer.

C. F. Christopher, oper-hearth superintendent of the **Railway Steel-Spring Division, American Locomotive Company,** has been promoted also to the position of chief metallurgist, made vacant by the death of Paul J. Neely. Mr. Christopher, from 1923 to 1928, was with the Jones & Laughlin Steel Corporation, serving in various positions until he finally became assistant superintendent of one of the open-hearth departments. He subsequently to 1934 was employed by the U. S. Bureau of Mines, Carnegie Institute of Technology and Metallurgical Advisory Board and then entered the employ of the Railway Steel-Spring Division, American Locomotive Company as open-hearth superintendent.

OBITUARY

Paul J. Neely, chief metallurgist, Railway Steel-Spring Division, American Locomotive Company, died at Latrobe, Pa., on December 10. Mr. Neely entered the employ of the Latrobe plant in 1903 in the chemical laboratory, and constantly advanced until he was appointed chief metallurgist.

Walter J. Edmonds, executive vice-president of the International General Electric Company, died suddenly of a heart attack on December 17, at his home in Scarsdale, N. Y. Mr. Edmonds was born at Utica, N. Y., in 1889. He entered the employ of the General Electric Company in 1912 and in 1919 he joined the International General Electric Company and became its comptroller. In 1925 he was appointed financial vice-president and since 1929 served as executive vice-president.

J. M. Lorenz, vice-president and general sales manager of the Ralco Manufacturing Company, Chicago, died in that city on December 13, after a short illness. Mr. Lorenz was born on January 14, 1865, at Ontario, Ohio, and graduated from the Northwestern Ohio Normal School in 1883. Subsequent thereto he was a salesman for the Western Publishing House

J. M. Lorenz

and the Central School Supply House until 1892, when he entered the service of the purchasing and supply department of the Chicago Telephone Company. He was later advanced to the position of chief clerk and assistant to the purchasing agent and storekeeper. In 1901 he became a salesman for the Central Electric Company, later the Central States General Electric Supply Company, serving as city and railroad salesman and manager of the Okonite and Ralco departments. In June, 1925, he was promoted to vice-president and manager of railroad sales, and in March, 1927, resigned to become vice-president and general sales manager of the Ralco Manufacturing Company, which position he was holding at the time of his death.

Equipment and Supplies

Frisco Program

Continuing a planned program of progress, the St. Louis-San Francisco during 1937 will spend $5,357,353 on new passenger and freight equipment and in mechanical and roadway improvements. Of this sum, $2,857,132 will be for rebuilding and improving locomotives, freight and passenger cars, all of which will be done in Frisco's shops.

The 1937 program provides for the building of 16 locomotives, 600 box cars, 100 coal cars, 250 hopper cars and 20 caboose cars. One new air-conditioned cafe-lounge car is to be built and four coaches are to be equipped with new style seats. Three more snack cars also will be added while 28 passenger cars will be air-conditioned, five of which are for the accommodation of Negro passengers.

A total of $1,160,297 will be spent for 112-lb. rails and other track material. The sum of $119,100 will be spent for the installation of block signals and interlocking while $1,002,553 will be spent on bridges, trestles and culverts.

LOCOMOTIVES

THE CHICAGO & ILLINOIS MIDLAND is inquiring for two locomotives of the 0-8-0 type.

FREIGHT CARS

THE NORFOLK SOUTHERN, reported in the *Railway Age* of November 28 as inquiring for 25 automobile cars, has ordered this equipment from the Magor Car Corporation.

THE DULUTH, MISSABE & NORTHERN has ordered 1000 ore cars of 75 tons capacity from the Pullman-Standard Car Manufacturing Company. Inquiry for this equipment was reported in the *Railway Age* of November 21.

THE NORFOLK & WESTERN has ordered 1,100 freight cars—1,000 hopper cars of 55 tons capacity from the Virginia Bridge Company, and 100 all-steel box cars of 50 tons capacity from the Greenville Steel Car Company.

THE UNION RAILROAD COMPANY has ordered 900 mill type gondolas, awarding 600 to the Pressed Steel Car Company, 200 to the Magor Car Corporation and 100 to the Ralston Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of November 21.

THE BESSEMER & LAKE ERIE has ordered 1,000 90-ton hopper cars from the Pullman-Standard Car Manufacturing Company, 500 70-ton hopper cars from the American Car & Foundry Company and 500 mill type gondola cars from the Greenville Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of November 21.

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An *Auxiliary* Boiler— *using no fuel!*

A locomotive boiler adds heat to the water at the expense of the fuel consumed.

The Elesco feed water heater adds heat to the water . . . using waste exhaust steam only. It is an auxiliary to the boiler—*reducing its fuel consumption* by the amount of exhaust steam condensed.

The dependability of the Elesco feed water heater is unquestioned. The heater uses approved principles of design, which are universally accepted. The pump is of rugged construction and utterly dependable.

Increase the boiler capacity of your locomotives with this dependable equipment.

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, Inc.

60 East 42nd Street
NEW YORK

ELESCO

Peoples Gas Building
CHICAGO

Canada: The Superheater Company, Limited, Montreal A-1108

Financial

ARCADIA & BETSEY RIVER.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon its line from Arcadia, Mich., to Henry, approximately 17 miles, as to interstate and foreign commerce.

ATCHISON, TOPEKA & SANTA FE.—*Acquisition.*—The Southern Kansas Stage Lines have asked authority of the Interstate Commerce Commission to acquire the franchise and equipment of H. L. Evans, doing business as the Silver Motor Freight Lines, which operates in Oklahoma. The line would be purchased for $11,000.

ATLANTA & ST. ANDREWS BAY. *Securities.*—This company has applied to the Interstate Commerce Commission for authority to issue $1,100,000 of 5 per cent first mortgage sinking fund bonds due in 1966, $850,000 of which will be used to retire $425,000 of the company's outstanding first mortgage 6 per cent 30 year gold bonds to be called for redemption at par April 1, 1937, and $425,000 of outstanding second mortgage refunding 6 per cent 25 year bonds to be called for redemption at par January 1, 1937. The balance of the issue will be applied to indebtedness to the St. Andrews Bay Holding Company. This company has also applied to the commission for authority to issue 3,000 shares of capital stock of par value of $100 to be issued and delivered to the St. Andrews Bay Holding Company in connection with the liquidation of an indebtedness, which, as of October 31 was $1,691,795.

CENTRAL VERMONT.—*Truck Permit Recommended.*—Joint Board No. 116 has recommended to the Interstate Commerce Commission that a permit be issued to the Vermont Transit Company, Inc., authorizing it to continue operation as a contract carrier by motor vehicle between St. Albans, Vt., and White River Junction, over regular routes, and off-route points within 20 miles of the regular routes, by reason of bona fide operations on July 1, 1935, and continuously since that date, under written contracts with the Central Vermont.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Equipment Trust Certificates.*—The Interstate Commerce Commission, Division 4, has authorized this company to assume obligation and liability in respect of $3,180,000 of equipment trust certificates, to be issued by the Continental Illinois National Bank & Trust Company of Chicago as trustee, and sold at 102.55205 and accrued dividends in connection with the procurement of certain equipment.

CHICAGO, ROCK ISLAND & PACIFIC.—*Equipment Trust.*—A banking group headed by Lehman Brothers have, subject to the approval of the Interstate Commerce Commission and the federal court, offered $2,400,000 of 3½ per cent equipment trust certificates of the trustees of this company, maturing 1937-47, and priced to yield from 0.8 per cent to 3.7 per cent.

GREAT NORTHERN. *Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability in respect of $4,650,000 of 2 per cent equipment trust certificates, to be issued by the First National Bank of New York City as trustee, in connection with the procurement of 1,000 box cars, 500 ore cars, 500 gondola cars, and 12 passenger coaches.

NASHVILLE, CHATTANOOGA & ST. LOUIS. —*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon a part of a branch line extending from Rock Spur, Tenn., to Ravenscroft, 12.5 miles.

NORTHERN PACIFIC.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon a part of its Green River branch line in King County, Wash., approximately seven-tenths of a mile.

NORTHERN PACIFIC.—MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized these companies to abandon a jointly owned track in Crow Wing county, Minn., approximately 5,815 feet.

SAVANNAH & ATLANTA. — *Reorganization.*—This company has applied to the Interstate Commerce Commission for approval of a loan of $1,700,000 from the Reconstruction Finance Corporation in connection with a revised plan of reorganization which was filed at the same time. About $1,000,000 of the loan will be used to pay off receivers' certificates, expenses of reorganization and to provide working capital, while the balance will be used for additions and betterments for the reorganized property.

UNION RAILROAD.—*Bonds.*—The Interstate Commerce Commission, Division 4, has authorized this company to assume obligation and liability in respect of $3,000,000 of first mortgage 5 per cent 50-year gold bonds and $2,500,000 of general mortgage 6 per cent gold bonds of the Monongahela Southern and in respect of $1,129,000 of general mortgage 30-year 5 per cent gold bonds of the St. Clair Terminal Railroad.

WABASH—*Semi-Annual Interest.*—The federal district court at St. Louis has authorized the Wabash to pay semi-annual interest due on January 1 on its first 5s, Detroit and Chicago extensions; Wabash Railroad first 4s, Des Moines Division; Wabash first lien terminal 4s and Wabash B debenture 6s.

Average Prices of Stocks and of Bonds

	Dec. 22	Last week	Last year
Average price of 20 representative railway stocks..	51.50	54.56	40.66
Average price of 20 representative railway bonds..	83.04	84.04	75.50

Dividends Declared

Albany & Susquehanna.—Special, $1.50, payable January 9 to holders of record December 23.

Joliet & Chicago.—$1.75, payable January 4 to holders of record December 22.

Railway Officers

EXECUTIVE

James Davies, general auditor of the Alton & Southern, has been elected vice-president, with headquarters at East St. Louis, Ill.

W. J. McDonald, assistant secretary and assistant treasurer for the Louisville & Nashville, with headquarters at New York, has been elected vice-president in charge of finance and accounting, effective January 1, succeeding **E. L. Smithers,** retired.

George D. Brooke, vice-president—operation and engineering of the Chesapeake & Ohio and the New York, Chicago & St. Louis has been elected to the newly-created position of executive vice-president of these companies and of the Pere Marquette with headquarters as before at Cleveland, Ohio. **A. T. Lowmaster,** general manager of the Chesapeake & Ohio at Richmond, Va., has been appointed also vice-president of that company.

Thomas H. Pindell, whose election as president of the Alton & Southern was reported in the December 12 issue of the *Railway Age*, was born on December 4, 1859, at Lexington, Ky. Mr. Pindell first entered railroad service as a telegraph operator on an Illinois line at the age of 15, leaving this company several years later to become a Western Union telegraph operator at St. Louis, Ill. In 1882, Mr. Pindell went with the Erie as a stenographer in the superintendent's office at Jersey City, N. J., being advanced through various positions to that of superintendent in 1891. In 1901 he left the Erie to go with the Lehigh Valley, where he served as division superintendent at various points until 1910, when his health failed and he was forced to return to his home at Springfield, Ill. Shortly thereafter, however, he joined the Chicago, Peoria & St. Louis (now partitioned) as superintendent. In 1914 Mr. Pindell went with the Alton

Thomas H. Pindell

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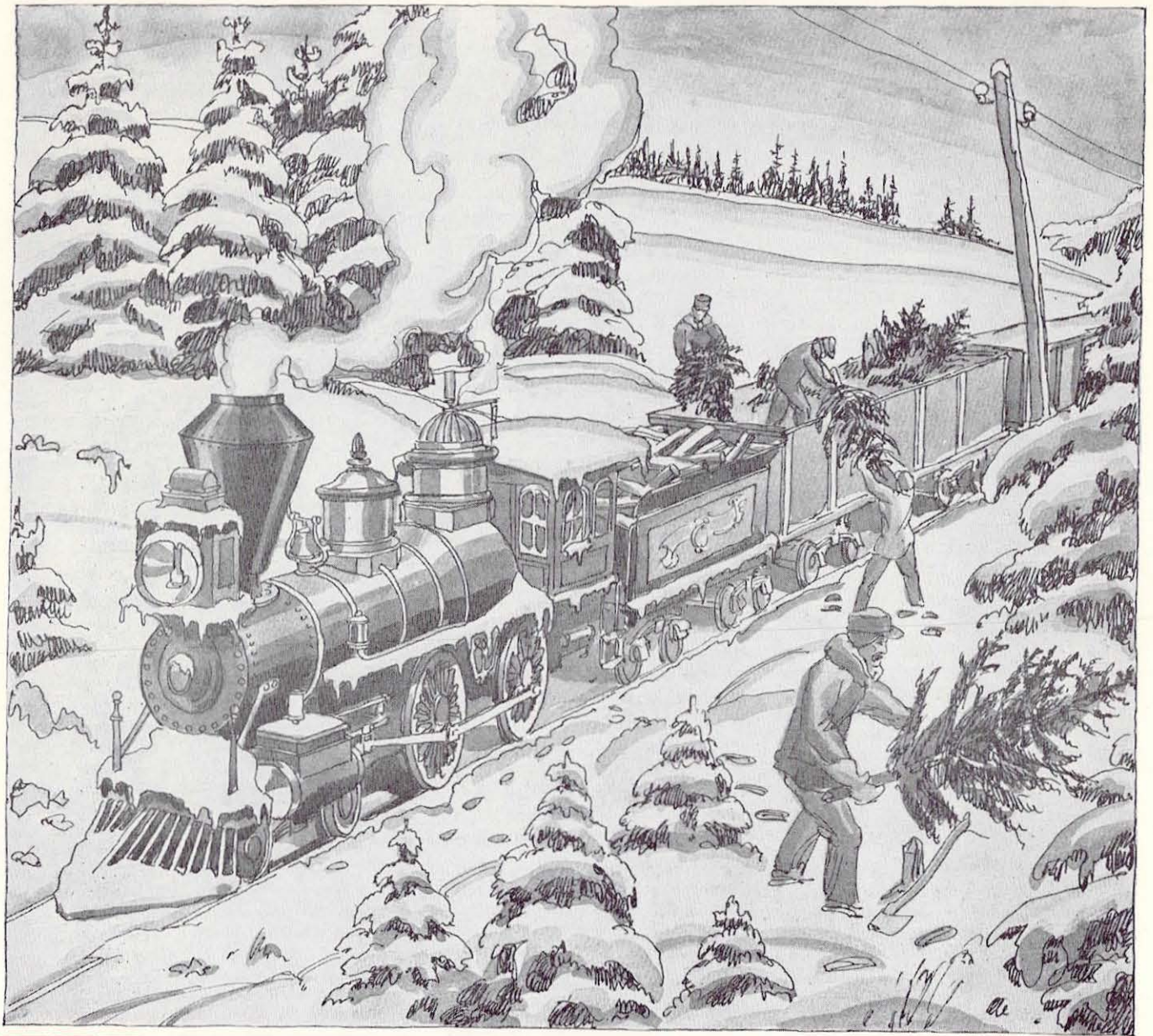
MERRY CHRISTMAS



HAPPY NEW YEAR

alco

AMERICAN LOCOMOTIVE COMPANY

30 CHURCH STREET · NEW YORK · N.Y.

& Southern as general manager, which position he held until his recent election to the presidency, with headquarters at East St. Louis, Ill., effective December 4.

FINANCIAL, LEGAL AND ACCOUNTING

J. R. Ford, assistant to the general auditor of the Alton & Southern, has been elected secretary and auditor, with headquarters at East St. Louis, Ill. **R. E. McClane** has been elected treasurer of this road.

J. M. O'Mahoney, assistant secretary of the New York Central System, has been appointed secretary with headquarters as before at New York, succeeding **E. F. Stephenson,** who died on December 12. **Burton H. Sheffer,** chief clerk in secretary's office, will succeed Mr. O'Mahoney.

TRAFFIC

F. A. Hunt has been appointed district passenger agent for the Seaboard Air Line, with headquarters at Cleveland, Ohio.

Charles H. Gattis, general passenger agent for the Seaboard Air Line, with headquarters at Norfolk, Va., has been appointed assistant passenger traffic manager, with the same headquarters. The position of general passenger agent at Norfolk has been abolished.

W. E. Erlenbach, traffic representative for the Wheeling & Lake Erie at Detroit, Mich., has been appointed general agent at Cleveland, Ohio, to succeed **E. F. Torgler,** who has been transferred to Canton, Ohio, where he replaces **F. A. Smith,** who has been transferred to Toledo, Ohio, to succeed **W. R. Prickman,** who has retired.

J. J. Nolan, district passenger agent for the Pullman Company at Chicago, has been promoted to assistant general passenger agent with the same headquarters, to succeed **E. A. Davenport,** who is retiring. **Howard Lowder,** district passenger agent at New York, has had his title changed to assistant general passenger agent. These changes will become effective on January 1.

OPERATING

T. M. McKeown, assistant general purchasing agent of the Canadian Pacific, with headquarters at Montreal, Que., has been appointed manager of the sleeping, dining and parlor car department, succeeding **W. A. Cooper,** who will retire under the pension rules of the company on December 31, after more than 45 years of service with this company.

J. H. Leary, terminal superintendent on the Western Pacific at Oakland, Cal., has been appointed superintendent of the Western division, with headquarters at Sacramento, to succeed **H. J. Beem,** who has resigned to become general superintendent of the Nevada Northern at Ely, Nev. **J. P. McSweeney,** trainmaster on the Western Pacific at Keddie, Cal., has been appointed to the newly-created position of terminal trainmaster at Oakland and the position of terminal superintendent at that point has been abolished. **L. D. Brady,** yardmaster at Portola, Cal., has been appointed trainmaster, with headquarters at Wendover, Utah, to succeed **J. J. Duggan,** who has been transferred to Keddie, to succeed Mr. McSweeney.

MECHANICAL

John B. Halliday, shop superintendent for the Pere Marquette, with headquarters at Wyoming, Mich., has been appointed master mechanic of the Canadian division, with headquarters at St. Thomas, Ont., succeeding **Elmer A. Kuhn,** who has been transferred in the same capacity to the Saginaw district, with headquarters at Saginaw, Mich., to succeed **R. A. Reid,** deceased.

OBITUARY

Robert A. Reid, master mechanic of the Pere Marquette, with headquarters at Saginaw, Mich., died on December 10 at the age of 61 years.

Col. Alexander Rudolph Lawton, former vice-president of the Central of Georgia, died on December 18 at Savannah, Ga., at the age of 78 years. Mr. Lawton retired in 1928.

F. D. Campbell, assistant superintendent of the car department of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Tacoma, Wash., died at Tacoma on December 14.

P. R. Albright, vice-president in charge of operations of the Atlantic Coast Line, with headquarters at Wilmington, N. C., died of a heart attack at his home in that city on December 17. He was 70 years old.

Roy W. Norris, superintendent of telegraph of the Chicago & North Western, with headquarters at Chicago, died at his home at West Chicago on December 20 following a week's illness. Mr. Norris was 67 years old.

Burton W. Farnham, resident engineer in the department of the engineer of grade crossings of the New York Central, with headquarters at New York, died at the Hotel George Washington in New York on December 18, following approximately 35 years of service in the engineering department of the road.

Leonard L. Sparrow, engineer of statistics of the Atlantic Coast Line, with headquarters at Wilmington, N. C., died on November 25 in that city, at the age of 64 years. Mr. Sparrow was born at Philadelphia, Pa., on November 17, 1872, and entered the service of the Atlantic Coast Line on May 1, 1904, as assistant engineer of construction. He was appointed engineer maintenance of way on August 1, 1907; office engineer on September 16, 1917; and principal assistant engineer on September 1, 1919. Mr. Sparrow became engineer of statistics on March 1, 1925.

George C. Cleveland, who retired in 1924 as chief engineer of the New York Central, West of Buffalo, with headquarters at Cleveland, Ohio, died on December 15. Mr. Cleveland was born on March 8, 1854, at Dover, Mass., and first entered railway service in 1873 with the Providence & Springfield (now part of the New York, New Haven & Hartford), serving as a rodman and instrumentman. From 1874 to 1879 he was in the service of the city of Boston, Mass., in an engineering capacity. At the end of this period, Mr. Cleveland entered private engineering practice at Newton, Mass., and in 1880 he entered the service of the Mexican Central, where subsequently he became principal assistant to the chief engineer. In 1891, after spending six years in private practice in Los Angeles, Cal., Mr. Cleveland entered the service of the Lake Shore & Michigan Southern (now New York Central) as principal assistant engineer, serving in this capacity until 1901, when he was made assistant chief engineer of the Lake Erie & Western (now part of the New York, Chicago & St. Louis). In 1905 he returned to the L. S. & M. S. as assistant chief engineer, being promoted to chief engineer at Cleveland, Ohio, in 1912. When the L. S. & M. S. was absorbed by the New York Central in 1915, Mr. Cleveland continued as chief engineer at Cleveland, retiring in 1924.

I. H. Luke, who retired in 1927 as general manager of the Denver & Rio Grande Western, died on December 20 in a Denver, Colo., hospital at the age of 75 years. Mr. Luke was born on a farm near Tama, Iowa, and entered railway service in 1877 in the roadway department of the Missouri Pacific, being transferred to the operating department four years later as a telegraph operator. From 1884 to 1889, Mr. Luke served as a train dispatcher, then becoming chief dispatcher, and in 1896 being promoted to division superintendent, in which capacity he served at Concordia, Kan., and at Sedalia, Mo. In December, 1902, he left the Missouri Pacific to enter the service of the Denver & Rio Grande (now the D. & R. G. W.) as superintendent of the Second division, with headquarters at Salida, Colo., later serving in the same capacity on the Third division. Five years after going with the D. & R. G. Mr. Luke entered the service of the Kansas City Southern as superintendent at Texarkana, Tex., returning to the D. & R. G. on January 6, 1910, as superintendent of the First division, with headquarters at Pueblo, Colo. Later in the same year he was appointed general manager of the Missouri, Oklahoma & Gulf (now part of the Midland Valley), with headquarters at Muskogee, Okla. Late in 1911 he again entered the service of the D. & R. G. and until February 1, 1917, he acted as superintendent of the Fourth division at Alamosa, Colo., superintendent of the Second division at Salida, and superintendent of the Salt Lake division at Salt Lake City, Utah. At the end of this period he became vice-president and general manager of the Utah, and on October 1, 1918, he was appointed general superintendent of the D. & R. G., becoming general superintendent of the Utah lines in 1922. He was promoted to general manager of the system in 1923, which position he held until his retirement in 1927.

Table of Operating Revenues and Expenses appears on next left-hand page

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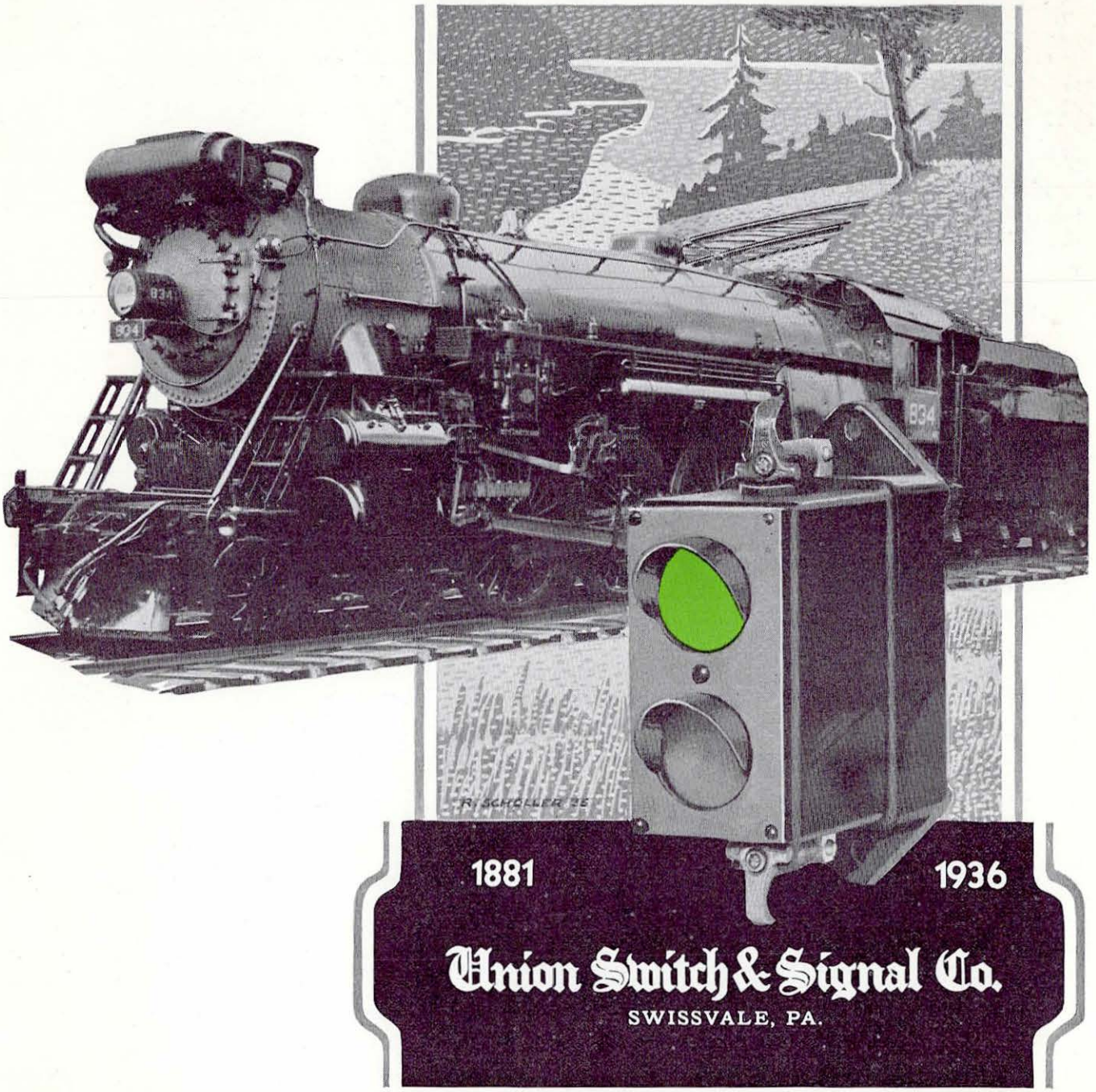

1881 1936

Union Switch & Signal Co.

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Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from 140 Monthly Reports of Revenues and Expenses Representing 144 Class I Steam Railways

FOR THE MONTH OF OCTOBER, 1936 AND 1935

Item	United States		Eastern District		Southern District		Western District	
	1936	1935	1936	1935	1936	1935	1936	1935
Average number of miles operated	236,550	237,579	58,546	58,840	44,854	45,111	133,150	133,628
Revenues:								
Freight	$326,055,841	$285,374,680	$133,332,399	$114,084,852	$63,187,375	$54,017,818	$129,536,067	$117,272,010
Passenger	33,913,523	28,612,399	18,982,367	16,591,121	4,212,012	3,392,372	10,719,144	8,628,906
Mail	8,309,996	7,762,391	3,179,046	3,034,520	1,439,785	1,374,389	3,691,165	3,353,482
Express	6,577,110	5,346,434	2,980,985	2,420,727	1,168,309	1,002,541	2,427,816	1,923,166
All other transportation	8,087,409	7,217,013	3,994,622	3,634,784	939,682	772,512	3,153,105	2,809,717
Incidental	7,748,903	6,098,849	4,049,155	3,168,117	936,717	804,060	2,763,031	2,126,672
Joint facility—Cr.	983,153	859,424	277,587	252,314	188,977	172,057	516,589	435,053
Joint facility—Dr.	218,634	232,098	50,993	47,363	21,092	20,921	146,549	163,814
Railway operating revenues	391,457,301	341,039,092	166,745,168	143,139,072	72,051,765	61,514,828	152,660,368	136,385,192
Expenses:								
Maintenance of way and structures	41,866,380	36,345,159	16,480,303	13,658,371	7,385,867	6,675,180	18,000,210	16,011,608
Maintenance of equipment	69,662,940	60,942,708	32,292,285	27,016,474	13,366,489	11,678,716	24,004,166	22,247,518
Traffic	8,423,161	7,786,449	3,176,628	3,021,037	1,629,764	1,469,789	3,616,769	3,295,623
Transportation	125,584,847	112,684,955	55,472,788	49,932,025	20,246,469	18,218,120	49,865,590	44,534,810
Miscellaneous operations	3,118,322	2,511,679	1,479,314	1,163,707	317,057	257,066	1,321,951	1,090,906
General	13,214,754	12,668,939	5,778,501	5,588,118	2,278,228	2,136,119	5,158,025	4,944,702
Transportation for investment—Cr.	658,043	418,113	106,565	83,389	92,991	37,287	458,487	297,437
Railway operating expenses	261,212,361	232,521,776	114,573,254	100,296,343	45,130,883	40,397,703	101,508,224	91,827,730
Net revenue from railway operations	130,244,940	108,517,316	52,171,914	42,842,729	26,920,882	21,117,125	51,152,144	44,557,462
Railway tax accruals	28,467,658	21,663,427	12,804,087	9,531,969	5,736,936	4,320,562	9,926,635	7,810,896
Railway operating income	101,777,282	86,853,889	39,367,827	33,310,760	21,183,946	16,796,563	41,225,509	36,746,566
Equipment rents—Dr. balance	8,564,310	8,391,907	3,472,937	3,582,598	68,671	*d* 37,311	5,022,702	4,846,620
Joint facility rent—Dr. balance	3,361,563	3,007,481	1,865,098	1,655,575	402,264	342,408	1,094,201	1,009,498
Net railway operating income	*a* 89,851,409	*b* 75,454,501	34,029,792	28,072,587	20,713,011	16,491,466	35,108,606	30,890,448
Ratio of expenses to revenues (per cent)	66.73	68.18	68.71	70.07	62.64	65.67	66.49	67.33
Depreciation included in operating expenses	16,217,388	16,362,191	7,162,370	7,299,542	3,177,469	3,198,070	5,877,549	5,864,579
Total maintenance before depreciation	95,311,932	80,925,676	41,610,218	33,375,303	17,574,887	15,155,826	36,126,827	32,394,547
Net railway operating income before depreciation	106,068,797	91,816,692	41,192,162	35,372,129	23,890,480	19,689,536	40,986,155	36,755,027

FOR TEN MONTHS ENDED WITH OCTOBER, 1936 AND 1935

Average number of miles operated	236,871	238,022	58,607	58,968	44,918	45,222	133,346	133,832
Revenues:								
Freight	$2,711,090,168	$2,313,117,099	$1,149,945,635	$986,549,928	$530,801,990	$453,418,386	$1,030,342,543	$873,148,785
Passenger	341,145,791	295,664,909	192,285,901	171,862,889	45,451,665	38,179,437	103,408,225	85,622,583
Mail	77,048,310	74,720,353	29,629,742	28,785,974	13,613,854	13,247,114	33,804,714	32,687,265
Express	48,640,115	43,922,436	19,831,108	17,764,926	9,948,297	9,615,655	18,860,710	16,541,855
All other transportation	70,996,116	62,448,661	36,890,631	33,243,497	7,249,275	6,292,048	26,856,210	22,913,116
Incidental	66,052,162	56,948,548	34,533,039	29,691,045	8,907,322	8,252,107	22,611,801	19,005,396
Joint facility—Cr.	9,318,805	8,015,079	2,847,458	2,476,142	2,017,071	1,808,381	4,454,276	3,730,556
Joint facility—Dr.	2,369,854	2,018,865	522,009	536,119	217,169	177,625	1,630,676	1,305,121
Railway operating revenues	3,321,921,613	2,852,818,220	1,465,441,505	1,269,838,282	617,772,305	530,635,503	1,238,707,803	1,052,344,435
Expenses:								
Maintenance of way and structures	385,107,381	333,877,189	148,136,421	127,173,609	68,017,511	62,503,491	168,953,449	144,200,089
Maintenance of equipment	647,167,808	561,548,054	292,934,083	247,471,596	119,090,921	107,121,158	235,142,804	206,955,300
Traffic	82,909,566	78,403,737	30,817,416	29,585,132	16,010,051	14,940,910	36,082,099	33,877,695
Transportation	1,154,716,052	1,035,182,952	526,213,946	474,825,126	189,393,449	172,328,130	439,108,657	388,029,696
Miscellaneous operations	29,443,022	24,999,530	13,262,980	11,448,610	3,472,318	2,977,552	12,707,724	10,573,368
General	130,736,306	118,808,293	57,400,088	54,290,353	22,242,409	20,720,989	51,093,809	43,796,951
Transportation for investment—Cr.	4,265,962	2,904,774	527,402	588,265	676,853	340,739	3,061,707	1,975,770
Railway operating expenses	2,425,814,173	2,149,914,981	1,068,237,532	944,206,161	417,549,806	380,251,491	940,026,835	825,457,329
Net revenue from railway operations	896,107,440	702,903,239	397,203,973	325,632,121	200,222,499	150,384,012	298,680,968	226,887,106
Railway tax accruals	259,959,157	204,181,080	110,873,967	85,595,666	53,149,691	41,880,164	95,935,499	76,705,250
Railway operating income	636,148,283	498,722,159	286,330,006	240,036,455	147,072,808	108,503,848	202,745,469	150,181,856
Equipment rents—Dr. balance	78,759,234	72,585,460	35,532,242	34,053,032	3,055,286	3,217,516	40,171,706	35,314,912
Joint facility rent—Dr. balance	32,761,205	29,480,429	17,880,684	16,785,730	3,958,150	2,910,481	10,922,371	9,784,218
Net railway operating income	*c* 524,627,844	*c* 396,656,270	232,917,080	189,197,693	140,059,372	102,375,851	151,651,392	105,082,726
Ratio of expenses to revenues (per cent)	73.02	75.36	72.90	74.36	67.59	71.66	75.89	78.44
Depreciation included in operating expenses	161,359,045	162,650,287	70,432,982	71,222,214	31,853,718	31,871,412	59,072,345	59,556,661
Total maintenance before depreciation	870,916,144	732,774,956	370,637,522	303,422,991	155,254,714	137,753,237	345,023,908	291,598,728
Net railway operating income before depreciation	685,986,889	559,306,557	303,350,062	260,419,907	171,913,090	134,247,263	210,723,737	164,639,387

a Includes charges to Railway Tax Accruals in the total amount of $6,148,272 itemized as follows: $1,566,036 for taxes under the requirements of the Social Security Act of 1935, and $4,582,236 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes (Public No. 400, 74th Congress).

b Includes credits to General Expenses in the amount of $293,592 on account of reversal of charges previously made for liability under the Railroad Retirement Act of 1934.

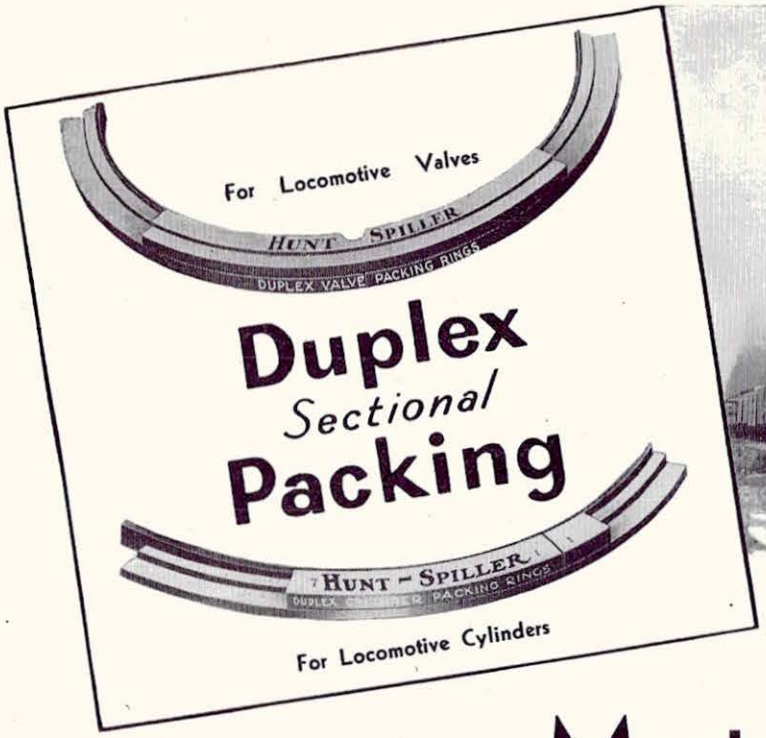
c Includes charges to Railway Tax Accruals in the total amount of $46,592,591 itemized as follows: $14,680,239 for taxes under the requirements of the Social Security Act of 1935, and $31,912,352 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes (Public No. 400, 74th Congress).

d Deficit or other reverse items.

e Includes credits to General Expenses in the amount of $7,662,169 on account of reversal of charges previously made for liability under the Railroad Retirement Act of 1934.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Table of Freight Operating Statistics appears on next left-hand page



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Freight Operating Statistics of Large Steam Railways—Selected Items for the Month of October,

Region, road, and year	Miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (*thousands*)	Car-miles: Per cent loaded	Ton-miles (*thousands*): Gross, excluding locomotives and tenders	Ton-miles (*thousands*): Net, revenue and non-revenue	Number of road locomotives on line: Serviceable: Not stored	Number of road locomotives on line: Serviceable: Stored	Number of road locomotives on line: Unserviceable	Number of road locomotives on line: Per cent unserviceable
New England Region:												
Boston & Albany 1936	373	136,657	140,927	9,603	3,298	67.2	177,461	62,567	57	10	25	27.2
1935	373	125,454	131,275	10,355	3,170	68.0	163,046	55,283	49	4	39	42.4
Boston & Maine 1936	1,963	291,017	327,049	27,593	10,640	70.3	579,591	221,398	131	..	139	51.5
1935	1,971	279,255	311,841	29,417	9,887	69.8	524,932	195,384	121	..	170	58.4
N. Y., New Hav. & Hartf. 1936	2,016	348,786	433,359	25,865	12,524	69.4	666,163	258,583	190	14	78	30.4
1935	2,049	348,818	423,800	22,384	11,704	67.7	621,629	234,476	178	8	118	38.8
Great Lakes Region:												
Delaware & Hudson 1936	831	239,098	326,381	37,868	8,724	68.4	533,327	262,244	112	124	36	13.2
1935	835	197,125	267,794	32,301	7,186	68.7	421,093	198,304	95	150	28	10.3
Del., Lack. & Western 1936	983	381,133	423,011	55,440	13,374	71.5	752,942	303,599	141	3	102	41.5
1935	992	354,088	390,558	49,766	11,524	66.6	652,822	244,934	116	34	96	39.0
Erie (incl. Chi. & Erie) 1936	2,298	776,238	830,822	48,190	35,431	68.0	2,088,285	810,932	236	33	203	43.0
1935	2,298	758,912	799,205	49,284	32,910	65.9	1,975,139	731,711	205	54	214	45.2
Grand Trunk Western 1936	1,027	273,319	276,239	2,521	7,136	65.6	419,381	151,665	80	1	56	40.9
1935	1,007	235,029	238,282	3,087	6,796	64.6	397,990	140,099	75	..	65	46.4
Lehigh Valley 1936	1,312	370,896	397,105	50,979	13,927	69.1	842,204	371,072	118	16	145	52.0
1935	1,319	375,301	395,216	38,833	12,227	66.9	736,815	298,578	118	4	166	57.6
New York Central 1936	10,793	2,896,809	3,066,414	181,768	101,357	62.4	6,499,403	2,839,764	935	95	497	32.5
1935	10,885	2,622,523	2,762,884	158,964	90,653	62.0	5,714,180	2,391,352	780	88	679	43.9
N. Y., Chicago & St. Louis 1936	1,672	514,815	519,712	7,896	18,828	67.9	1,097,812	435,838	149	16	27	14.1
1935	1,661	446,160	450,170	7,055	15,880	66.2	925,594	353,228	138	30	23	12.0
Pere Marquette 1936	2,081	400,105	417,471	6,036	10,790	63.9	674,845	263,417	120	2	27	18.1
1935	2,090	391,525	407,303	5,747	10,075	61.9	648,341	246,655	115	1	38	24.7
Pittsburgh & Lake Erie 1936	234	97,066	100,122	.....	3,932	63.1	331,356	191,316	38	7	20	30.8
1935	234	68,880	71,288	56	2,895	63.4	240,369	139,239	29	11	35	46.7
Wabash 1936	2,434	598,060	607,819	11,600	18,895	69.3	1,074,901	404,747	124	35	144	47.5
1935	2,435	575,002	586,047	12,433	18,430	65.5	1,064,222	371,261	121	32	168	52.3
Central Eastern Region:												
Baltimore & Ohio 1936	6,366	1,676,529	2,058,245	212,896	52,309	64.0	3,559,462	1,647,436	683	28	581	45.0
1935	6,325	1,433,112	1,767,210	189,708	44,681	64.6	2,959,635	1,348,181	632	59	628	47.6
Central of New Jersey 1936	681	162,718	182,387	36,148	5,479	62.7	367,898	175,306	58	14	75	51.0
1935	684	145,032	164,477	30,904	4,878	61.5	326,598	153,118	60	3	92	59.4
Chicago & Eastern Illinois 1936	931	183,188	184,154	2,977	5,049	69.7	310,350	140,571	54	..	53	49.5
1935	939	170,838	172,077	2,868	4,303	66.8	268,944	119,269	44	5	60	55.0
Elgin, Joliet & Eastern 1936	434	106,381	107,955	2,358	2,856	60.7	220,336	110,761	56	..	29	34.1
1935	434	86,588	87,549	1,417	2,269	62.8	170,955	85,705	48	4	35	40.2
Long Island 1936	393	36,203	36,624	17,621	334	49.6	26,080	9,464	33	1	16	32.0
1935	393	29,247	30,361	14,490	281	49.4	22,192	8,355	34	..	17	33.3
Pennsylvania System 1936	10,034	3,324,903	3,769,746	420,748	119,304	64.5	8,074,140	3,771,802	1,487	146	715	30.5
1935	10,009	2,794,926	3,164,955	335,787	100,800	64.3	6,588,394	2,930,138	1,210	142	1,067	44.1
Reading 1936	1,449	453,980	493,434	56,424	13,329	64.9	939,331	462,530	209	39	93	27.3
1935	1,452	400,603	436,315	49,867	11,576	60.1	804,570	378,535	181	79	96	27.0
Pocahontas Region:												
Chesapeake & Ohio 1936	3,050	980,001	1,040,966	51,098	47,788	56.7	4,073,220	2,254,999	413	31	85	16.1
1935	3,050	901,653	955,088	40,797	41,277	55.9	3,520,418	1,923,661	383	59	104	19.0
Norfolk & Western 1936	2,160	756,845	808,225	40,108	33,104	59.6	2,788,062	1,524,517	275	47	38	10.6
1935	2,145	667,061	704,029	35,383	28,331	59.3	2,337,084	1,242,339	245	73	59	15.6
Southern Region:												
Atlantic Coast Line 1936	5,079	557,010	558,777	7,701	11,948	67.5	624,950	232,409	219	48	100	27.2
1935	5,146	482,177	482,500	6,402	9,934	66.8	502,891	177,740	236	57	125	29.9
Central of Georgia 1936	1,886	254,928	257,639	3,417	6,111	74.6	322,060	129,354	97	..	27	21.8
1935	1,886	233,750	235,430	3,710	5,548	73.0	282,787	108,771	99	..	43	30.3
Illinois Central (incl. Y. & M. V.) 1936	6,562	1,775,974	1,790,947	34,134	44,184	64.3	2,815,381	1,179,188	665	12	209	23.6
1935	6,587	1,518,483	1,530,646	29,299	37,924	64.6	2,370,621	986,218	598	36	218	25.6
Louisville & Nashville 1936	4,969	1,233,750	1,349,767	35,742	30,636	60.7	2,158,773	1,050,826	373	9	190	33.2
1935	5,045	1,034,547	1,124,737	30,274	25,523	60.9	1,782,372	873,664	306	10	264	45.5
Seaboard Air Line 1936	4,295	475,480	499,223	6,230	12,637	70.3	706,659	281,349	219	11	107	31.8
1935	4,295	426,424	436,601	4,070	10,677	70.3	584,331	226,516	197	16	132	38.3
Southern 1936	6,596	1,389,566	1,414,949	24,053	32,240	69.0	1,792,234	728,367	495	24	267	34.0
1935	6,599	1,181,936	1,200,222	19,358	28,170	69.7	1,485,460	569,790	433	53	324	40.0
Northwestern Region:												
Chicago & North Western 1936	8,355	1,092,914	1,140,358	33,553	31,139	62.6	1,963,495	747,336	379	121	214	30.0
1935	8,428	1,074,339	1,125,925	32,861	28,058	61.3	1,767,666	617,276	438	105	227	29.5
Chicago Great Western 1936	1,458	324,432	326,248	10,726	9,856	62.0	604,332	217,058	72	..	17	19.1
1935	1,458	246,696	248,521	16,154	7,902	64.0	470,291	171,532	62	2	29	31.2
Chi., Milw., St. P. & Pac. 1936	11,118	1,546,336	1,657,124	74,168	42,675	61.8	2,701,203	1,080,788	496	71	113	16.6
1935	11,119	1,414,390	1,516,899	67,544	38,744	61.0	2,442,791	977,677	431	95	141	21.1
Chi., St. P., Minneap. & Om. 1936	1,637	245,043	259,909	12,728	5,768	65.6	357,304	148,499	91	33	21	14.5
1935	1,641	232,461	243,778	11,702	5,411	66.6	328,206	138,568	74	36	33	23.1
Great Northern 1936	8,059	1,116,494	1,126,130	43,547	39,218	59.3	2,672,396	1,126,539	407	20	138	24.4
1935	8,031	1,035,607	1,047,051	36,787	36,702	59.4	2,483,499	1,046,021	423	29	146	24.4
Minneap., St. P. & S. St. M. 1936	4,273	418,263	429,298	5,781	10,181	66.7	604,982	256,289	124	..	30	19.5
1935	4,273	395,905	402,499	3,808	9,637	68.1	554,602	247,541	131	..	23	14.9
Northern Pacific 1936	6,429	864,509	965,346	62,575	28,227	67.9	1,673,095	702,130	369	1	73	16.5
1935	6,421	783,618	859,647	60,765	24,682	65.1	1,514,015	635,478	351	3	99	21.9
Central Western Region:												
Alton 1936	912	213,795	224,739	2,031	5,164	68.6	313,607	123,906	77	6	17	17.0
1935	921	210,554	220,495	2,390	5,023	65.2	313,543	117,842	69	4	27	27.0
Atch., Top. & S. Fe (incl. G.C. & S.F. & P. & S.F.) 1936	13,228	2,100,100	2,284,880	118,847	62,970	64.0	3,922,716	1,326,936	598	67	308	31.7
1935	13,260	1,990,454	2,153,721	107,956	59,961	63.8	3,665,526	1,187,760	564	84	356	35.5
Chicago, Burl. & Quincy 1936	8,899	1,566,234	1,650,512	65,839	42,664	62.2	2,586,320	1,071,189	453	..	85	15.8
1935	8,971	1,509,808	1,588,717	57,583	39,978	59.6	2,432,306	991,715	463	..	86	15.7
Chi., Rock I. & Pac. (incl. Chi., Rock I. & Gulf) 1936	8,128	1,217,434	1,241,090	6,673	28,421	66.8	1,678,144	670,242	412	32	235	34.6
1935	8,272	1,086,937	1,106,298	5,601	25,529	65.7	1,504,969	580,943	352	32	342	47.1
Denv. & Rio Gr. Western 1936	2,576	487,293	546,525	64,819	11,769	62.8	739,323	285,267	201	..	9	4.3
1935	2,584	417,246	463,282	52,705	10,735	65.7	624,330	240,109	180	1	36	16.6
Southern Pac.—Pac. Lines 1936	8,614	1,705,057	1,871,487	232,896	57,676	66.2	3,501,765	1,274,784	592	62	154	19.1
1935	8,599	1,393,083	1,520,916	182,286	46,812	64.2	2,892,696	980,600	457	85	249	31.4
Union Pacific 1936	9,918	2,415,803	2,498,573	127,946	76,623	62.4	4,784,324	1,651,774	696	26	150	17.2
1935	9,824	2,293,396	2,384,095	139,651	71,481	62.1	4,398,281	1,486,188	664	36	185	20.9
Southwestern Region:												
Mo.-Kans.-Texas Lines 1936	3,282	418,781	424,506	6,487	11,646	64.9	700,178	263,069	110	20	72	35.6
1935	3,282	398,200	402,460	6,406	11,428	64.7	679,378	253,688	93	28	77	38.9
Missouri Pacific 1936	7,188	1,380,621	1,412,846	32,542	38,382	62.5	2,445,113	973,899	362	53	114	21.6
1935	7,202	1,264,271	1,303,073	27,240	34,322	63.1	2,147,837	830,614	298	91	157	28.8
St. Louis-San Francisco 1936	4,888	831,163	840,651	11,218	17,789	64.0	1,101,579	455,512	291	64	68	16.1
1935	4,888	703,257	709,591	8,792	15,498	63.3	930,308	365,461	261	109	61	14.2
St. Louis Southw. Lines 1936	1,733	269,826	270,774	3,401	7,548	71.5	418,547	168,389	99	11	7	6.0
1935	1,767	226,023	238,337	3,097	5,935	72.3	321,500	125,475	98	14	9	7.4
Texas & New Orleans 1936	4,416	615,420	617,579	11,125	14,938	69.1	899,755	364,416	204	41	50	16.9
1935	4,417	526,918	526,940	9,477	12,443	64.7	759,524	282,558	199	43	53	18.0
Texas & Pacific 1936	1,944	320,059	320,059	1,533	9,262	65.7	558,734	207,690	76	45	90	42.7
1935	1,945	250,796	250,796	1,485	7,868	65.9	460,403	164,727	76	65	79	35.9

NOTE:—Effective with carrier reports for the month of January, 1936, the rules relative to operating statistics of large steam railways were revised with the following effect on this statement: Miles of road operated, number of locomotives on line, and number of freight cars on line were changed from averages for the month to actual figures as of the close of the month. Freight train and locomotive-miles, which formerly applied only to freight trains and the *freight proportion of mixed trains*, based on car-miles, were changed to apply to freight trains and all mixed trains handling more freight-train cars than passenger-train cars. Carriers were not required to rework 1935 figures according to the revised rules, but they have in some cases supplied considerable comparable data. In other cases, the figures shown in this statement for last year were restated by the carriers from last year's reports, or inserted from such reports by the Bureau of Statistics.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

1936, Compared with October, 1935, for Roads with Annual Operating Revenues Above $25,000,000

Region, road, and year	Number of freight cars on line: Home	Foreign	Total	Per cent unserviceable	Gross ton-miles per train-hour, excluding locomotives and tenders	Gross ton-miles per train-mile, excluding locomotives and tenders	Net ton-miles per train-mile	Net ton-miles per loaded car-mile	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotives and tenders	Locomotive-miles per locomotive-day
New England Region:													
Boston & Albany 1936	2,640	4,103	6,743	24.4	21,235	1,304	460	19.0	299	23.4	5,413	154	**52.8**
1935	2,783	4,665	7,448	23.6	21,205	1,307	443	17.4	238	20.1	4,778	151	**48.6**
Boston & Maine 1936	7,142	8,563	15,705	15.3	26,417	1,999	764	20.8	450	30.7	3,638	101	**40.7**
1935	7,933	8,084	16,017	14.8	25,357	1,887	702	19.8	394	28.5	3,198	103	**38.4**
N. Y., New Hav. & Hartf. 1936	9,949	11,865	21,814	16.5	26,794	1,945	755	20.6	376	26.2	4,138	103	**52.2**
1935	13,055	11,873	24,928	15.8	25,002	1,817	685	20.0	303	22.4	3,691	106	**47.3**
Great Lakes Region:													
Delaware & Hudson 1936	7,674	3,815	11,489	4.0	30,993	2,244	1,103	30.1	738	35.8	10,183	104	**43.8**
1935	10,831	2,953	13,784	3.5	29,659	2,149	1,012	27.6	490	25.8	7,658	110	**35.3**
Del., Lack. & Western 1936	12,412	7,220	19,632	18.0	32,690	2,002	807	22.7	501	30.8	9,966	127	**63.3**
1935	14,712	6,275	20,987	13.2	31,454	1,872	702	21.3	374	26.4	7,966	132	**58.2**
Erie (incl. Chi. & Erie) 1936	16,019	19,856	35,875	2.8	44,117	2,708	1,052	22.9	723	46.4	11,386	96	**57.9**
1935	20,083	15,429	35,512	6.1	44,691	2,626	973	22.2	677	46.2	10,271	94	**59.9**
Grand Trunk Western 1936	5,033	8,136	13,169	14.3	29,013	1,551	561	21.3	381	27.3	4,763	101	**65.4**
1935	5,062	8,123	13,185	17.0	37,112	1,714	603	20.6	348	26.2	4,489	102	**55.6**
Lehigh Valley 1936	10,449	10,677	21,126	6.8	38,430	2,307	1,016	26.6	580	31.5	9,122	125	**51.3**
1935	12,658	7,189	19,847	6.4	36,732	2,004	812	24.4	480	29.4	7,303	122	**48.3**
New York Central 1936	95,690	73,569	169,259	19.4	36,285	2,267	991	28.0	544	31.1	8,488	100	**68.9**
1935	118,539	70,198	188,737	20.1	35,726	2,203	922	26.4	409	25.0	7,087	101	**61.5**
N. Y., Chicago & St. Louis. 1936	5,060	8,923	13,983	2.3	37,291	2,134	847	23.1	1,000	63.6	8,410	88	**88.6**
1935	7,142	7,600	14,742	5.9	36,274	2,077	793	22.2	786	53.3	6,861	90	**77.2**
Pere Marquette 1936	7,592	8,868	16,460	2.7	26,827	1,689	659	24.4	535	34.3	4,082	92	**90.8**
1935	9,393	8,284	17,677	4.4	25,844	1,657	630	24.5	474	31.2	3,808	92	**85.7**
Pittsburgh & Lake Erie 1936	12,041	12,834	24,875	32.3	44,966	3,426	1,978	48.7	243	7.9	26,393	85	**48.2**
1935	13,725	11,028	24,753	41.8	47,645	3,504	2,030	48.1	172	5.6	19,221	99	**30.7**
Wabash 1936	10,926	10,771	21,697	6.1	35,581	1,816	684	21.4	593	39.8	5,364	108	**65.4**
1935	11,379	9,572	20,951	3.4	37,225	1,868	652	20.1	573	43.5	4,919	108	**60.2**
Central Eastern Region:													
Baltimore & Ohio 1936	60,221	32,651	92,872	18.1	26,837	2,156	998	31.5	572	28.4	8,348	140	**56.7**
1935	68,559	26,008	94,567	19.0	26,660	2,099	956	30.2	460	23.6	6,876	145	**47.9**
Central of New Jersey 1936	10,671	11,207	21,878	30.2	26,479	2,352	1,121	32.0	195	9.7	8,302	139	**48.0**
1935	12,713	9,240	21,953	34.6	26,909	2,348	1,101	31.4	220	11.4	7,221	144	**40.5**
Chicago & Eastern Illinois 1936	2,203	3,959	6,162	6.5	30,193	1,707	773	27.8	716	36.9	4,869	115	**55.9**
1935	3,295	3,220	6,515	8.7	27,853	1,587	704	27.7	607	32.8	4,098	126	**51.8**
Elgin, Joliet & Eastern 1936	7,694	6,686	14,380	4.5	17,399	2,119	1,065	38.8	259	11.0	8,231	112	**41.6**
1935	7,648	3,781	11,429	7.2	17,284	2,020	1,013	37.8	245	10.3	6,369	111	**33.0**
Long Island 1936	549	2,994	3,543	2.6	5,750	735	267	28.3	83	5.9	777	316	**35.0**
1935	761	3,027	3,788	3.0	5,725	777	293	29.7	67	4.5	686	306	**28.6**
Pennsylvania System 1936	183,810	67,304	251,114	17.8	33,920	2,474	1,155	31.6	480	23.6	12,126	115	**57.6**
1935	225,983	56,282	282,265	17.2	32,831	2,398	1,066	29.1	331	17.7	9,443	116	**46.6**
Reading 1936	22,839	13,676	36,515	8.8	24,482	2,076	1,022	34.7	413	18.4	10,297	135	**51.9**
1935	26,879	10,211	37,090	11.0	24,865	2,014	948	32.7	328	16.7	8,412	143	**43.4**
Pocahontas Region:													
Chesapeake & Ohio 1936	37,597	17,085	54,682	1.0	55,202	4,206	2,329	47.2	1,337	49.9	23,851	71	**66.2**
1935	36,558	14,780	51,338	1.8	53,199	3,951	2,159	46.6	1,243	47.7	20,345	74	**58.6**
Norfolk & Western 1936	27,168	5,213	32,381	1.4	52,051	3,720	2,034	46.1	1,454	53.0	22,772	94	**75.3**
1935	31,332	5,395	36,727	1.9	49,881	3,538	1,881	43.9	1,105	42.4	18,684	99	**63.0**
Southern Region:													
Atlantic Coast Line 1936	18,024	8,633	26,657	25.6	19,005	1,124	418	19.5	285	21.7	1,476	108	**48.5**
1935	22,523	6,466	28,989	22.2	17,817	1,044	369	17.9	199	16.6	1,114	117	**37.3**
Central of Georgia 1936	2,982	4,069	7,051	2.9	22,409	1,266	508	21.2	592	37.5	2,213	118	**67.9**
1935	5,248	3,648	8,896	19.5	21,370	1,213	466	19.6	394	27.5	1,861	127	**54.3**
Illinois Central (incl. Y. & M. V.) 1936	30,171	26,349	56,520	22.3	25,413	1,600	670	26.7	664	38.7	5,796	129	**66.5**
1935	41,177	21,887	63,064	33.5	25,744	1,572	654	26.0	512	30.5	4,830	129	**58.7**
Louisville & Nashville 1936	31,409	12,077	43,486	20.7	25,867	1,752	853	34.3	779	37.4	6,822	124	**78.0**
1935	36,389	10,100	46,489	29.8	26,187	1,730	848	34.2	551	29.0	5,587	121	**64.0**
Seaboard Air Line 1936	9,299	7,330	16,629	2.4	22,537	1,514	603	22.3	557	35.5	2,113	116	**48.5**
1935	9,955	5,703	15,658	3.8	20,305	1,389	538	21.2	477	31.9	1,701	120	**40.5**
Southern 1936	21,707	22,119	43,826	15.5	21,116	1,301	529	22.6	550	35.3	3,562	149	**58.7**
1935	24,621	18,269	42,890	14.3	20,986	1,263	485	20.2	439	31.2	2,785	150	**48.6**
Northwestern Region:													
Chicago & North Western 1936	34,429	24,950	59,379	7.1	26,729	1,812	690	24.0	404	26.9	2,885	116	**53.0**
1935	37,975	21,234	59,209	9.3	24,568	1,651	576	22.0	332	24.7	2,363	119	**48.5**
Chicago Great Western 1936	1,834	5,441	7,275	2.1	31,487	1,864	670	22.0	1,009	73.9	4,802	125	**124.2**
1935	1,563	3,782	5,345	2.0	35,693	1,909	696	21.7	1,004	72.2	3,795	129	**91.8**
Chi., Milw., St. P. & Pac. 1936	40,082	23,808	63,890	2.6	27,193	1,756	703	25.3	538	34.4	3,136	124	**82.1**
1935	45,505	19,742	65,247	2.8	26,823	1,736	695	25.2	483	31.4	2,836	120	**76.6**
Chi., St. P., Minneap. & Om. 1936	3,631	6,265	9,896	9.1	18,816	1,464	608	25.7	497	29.5	2,926	111	**59.8**
1935	3,647	6,393	10,040	10.0	19,416	1,421	600	25.6	436	25.5	2,723	118	**58.0**
Great Northern 1936	35,562	15,742	51,304	6.8	35,479	2,410	1,016	28.7	695	40.8	4,509	109	**65.7**
1935	37,601	13,958	51,559	6.4	34,846	2,414	1,017	28.5	623	36.8	4,202	110	**58.4**
Minneap., St. P. & S. St. M. 1936	12,401	5,320	17,721	5.7	22,253	1,456	617	25.2	464	27.6	1,935	103	**90.5**
1935	12,658	4,461	17,119	4.2	21,601	1,416	632	25.7	455	26.0	1,869	102	**81.9**
Northern Pacific 1936	25,905	9,343	35,248	7.3	29,334	1,942	815	24.9	626	37.1	3,523	143	**74.9**
1935	29,148	8,044	37,192	10.6	28,663	1,943	815	25.7	540	32.3	3,192	146	**65.4**
Central Western Region:													
Alton 1936	2,262	6,260	8,522	24.0	34,394	1,475	583	24.0	461	28.0	4,385	121	**73.9**
1935	2,391	6,983	9,374	22.8	34,003	1,495	562	23.5	407	26.6	4,127	120	**71.9**
Atch., Top. & S. Fe (incl. G.C. & S.F. & P. & S.F.) 1936	59,126	16,656	75,782	8.9	33,918	1,874	634	21.1	564	41.9	3,236	118	**79.6**
1935	65,412	12,997	78,409	11.3	33,654	1,848	599	19.8	483	38.3	2,889	116	**72.7**
Chicago, Burl. & Quincy 1936	23,365	22,012	45,377	5.9	28,483	1,663	689	25.1	771	49.3	3,883	123	**102.8**
1935	27,402	17,422	44,824	8.0	27,703	1,621	661	24.8	710	48.1	3,566	120	**96.7**
Chi., Rock I. & Pac. (incl. Chi., Rock I. & Gulf) 1936	21,099	16,387	37,486	7.4	24,173	1,382	552	23.6	587	37.2	2,660	132	**57.9**
1935	25,822	12,738	38,560	12.7	23,552	1,390	537	22.8	487	32.6	2,266	133	**49.4**
Denv. & Rio Gr. Western 1936	11,217	5,671	16,888	5.4	22,329	1,528	590	24.2	538	35.4	3,572	168	**94.8**
1935	11,659	4,758	16,417	6.3	21,950	1,506	579	22.4	468	31.9	2,997	168	**76.7**
Southern Pac.—Pac. Lines 1936	31,138	29,627	60,765	7.3	31,954	2,072	754	22.1	665	45.4	4,774	107	**84.9**
1935	33,692	25,551	59,243	8.8	32,212	2,095	710	20.9	535	39.9	3,679	105	**70.3**
Union Pacific 1936	37,850	26,849	64,699	9.0	39,276	1,992	688	21.6	836	62.0	5,372	117	**96.3**
1935	40,670	25,002	65,672	13.0	38,060	1,934	654	20.8	754	58.5	4,880	106	**91.8**
Southwestern Region:													
Mo.-Kans.-Texas Lines 1936	3,271	6,778	10,049	3.2	29,302	1,673	629	22.6	843	57.5	2,586	89	**68.8**
1935	4,966	5,811	10,777	2.9	29,537	1,709	638	22.2	758	52.8	2,494	84	**66.6**
Missouri Pacific 1936	13,179	27,142	40,321	2.6	30,274	1,781	710	25.4	770	48.5	4,370	121	**88.0**
1935	14,849	22,169	37,018	2.8	29,692	1,705	659	24.2	723	47.4	3,720	124	**78.9**
St. Louis-San Francisco 1936	13,651	9,373	23,024	7.5	24,414	1,330	550	25.6	638	38.9	3,006	134	**65.0**
1935	17,761	6,802	24,563	5.6	24,412	1,328	522	23.6	480	32.1	2,412	131	**53.8**
St. Louis Southw. Lines 1936	2,441	4,464	6,905	2.9	25,823	1,556	626	22.3	807	50.6	3,134	100	**76.2**
1935	2,838	2,897	5,735	6.0	23,462	1,429	558	21.1	715	46.7	2,290	103	**65.4**
Texas & New Orleans 1936	6,636	13,077	19,713	5.9	25,397	1,474	597	24.4	600	35.6	2,662	91	**68.7**
1935	6,766	12,314	19,080	7.2	24,085	1,451	540	22.7	489	33.2	2,063	89	**57.7**
Texas & Pacific 1936	2,513	6,346	8,859	3.1	27,194	1,751	651	22.4	786	53.4	3,446	91	**48.9**
1935	2,545	5,470	8,015	3.2	26,601	1,837	657	20.9	680	49.1	2,731	88	**37.0**

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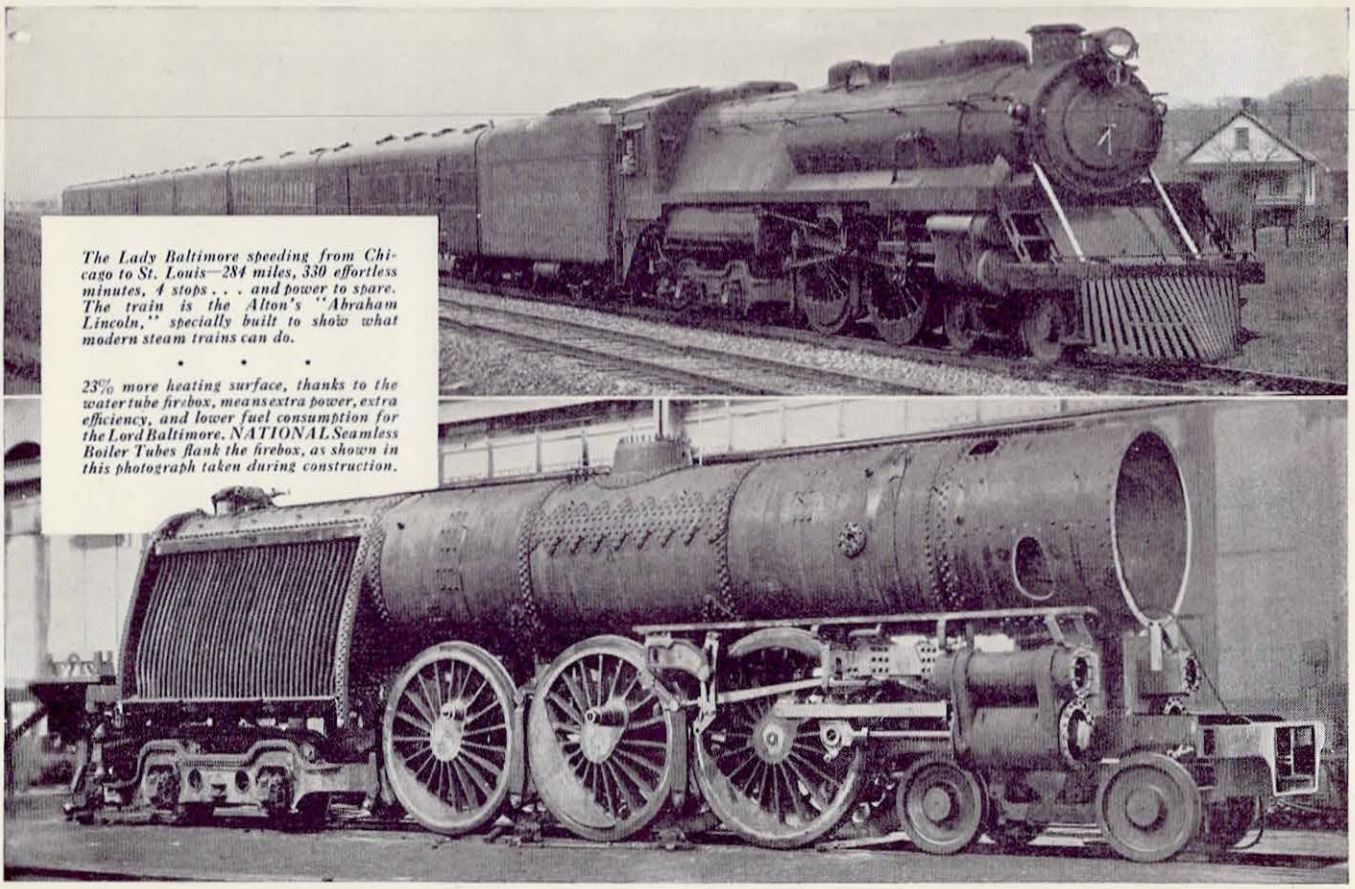

The Lady Baltimore speeding from Chicago to St. Louis—284 miles, 330 effortless minutes, 4 stops . . . and power to spare. The train is the Alton's "Abraham Lincoln," specially built to show what modern steam trains can do.

* * *

23% more heating surface, thanks to the water tube firebox, means extra power, extra efficiency, and lower fuel consumption for the Lord Baltimore. NATIONAL Seamless Boiler Tubes flank the firebox, as shown in this photograph taken during construction.

THERE'S an interesting story back of the Lord Baltimore and Lady Baltimore that speed the Alton's crack limited "Abraham Lincoln" between Chicago and St. Louis.

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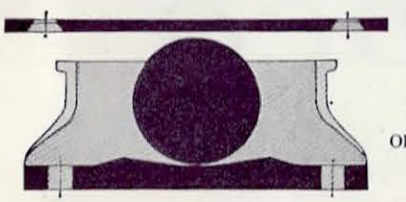

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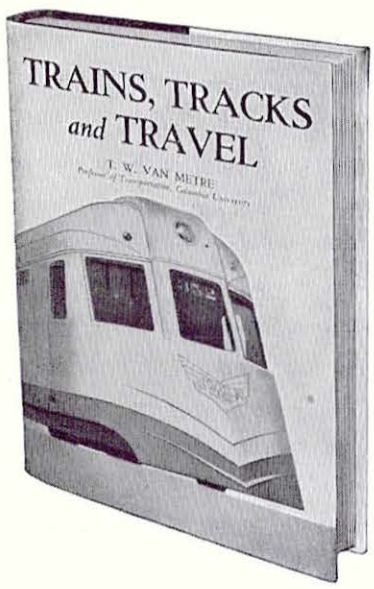

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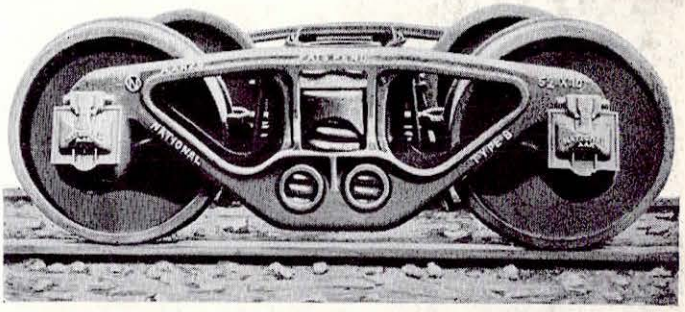

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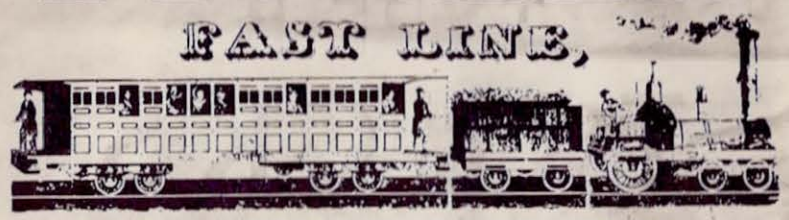

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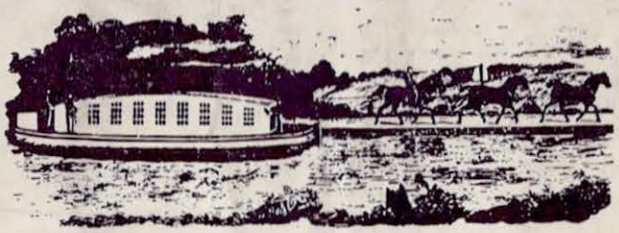

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